A NEW

METHOD

OF

Improving Cold, Wet, and Barren

LANDS:

Particularly

Clayey-Grounds.

WITH

The Manner of burning CLAY, TURF, and MOLE-HILLS; as practiſed in *North-Britain.*

To which is added,

The METHOD of cultivating and raiſing FRUIT TREES in ſuch Soils.

——————*ſed famam extendere factis*
Hoc virtutis opus. VIRG.

LONDON:

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TO

COCKIN SOLE, *Eſq*;

Of *KENT*.

SIR,

AS You are of Opinion that the following Obſervations for the Improvement of barren and clayey Lands (many of which are founded on Your own Experience) may be of real Uſe to the Farmer, I ſhall make no Apology for offering them to the Publick; and I hope I need make none for addreſſing them to You, whoſe Knowledge in Agriculture, as

well as generous Aſſiſtance in the Progreſs of the Work, entitles you to patronize it.

If the Treatiſe can boaſt of any Merit, I muſt ingenuouſly confeſs that it is chiefly owing to *Columella* and *Virgil* among the Ancients, and to the ſolid Obſervations which You, Sir, have been ſo good as to communicate to me.

I thought it fair to the Publick, and a Debt of Juſtice, as well as Gratitude which I owed to my Benefactors, to make theſe Acknowledgements; for as there is no Crime of a blacker Dye than Ingratitude, ſo I know no Duty that is accompanied with a ſublimer Pleaſure in the Performance of it, than

than Gratitude to one's Benefactors; The Overflowings of which are perhaps the only Discharge that ſome find from the Load of Obligations they lie under.-----This indeed is my Caſe at preſent; for whatever Satisfaction I feel in indulging the Sentiments of a grateful Mind, I am ſufficiently ſenſible that the Acknowledgements I make can be of no farther Uſe to you, than in exciting that Pleaſure which every noble Mind muſt feel in reflecting on its own Acts of Generoſity and Goodneſs.

How much the Publick is indebted to You, the Publick itſelf muſt judge. How much I have been, I my ſelf am moſt conſcious, and

and I hope You will forgive me for taking this Opportunity of acknowledging your many Favours; and believe me to be with great Reſpect,

SIR,

your moſt obedient,

and obliged

humble Servant,

CONTENTS.

CHAP.

CONTENTS.

INTRO-

INTRODUCTION.

Inventas aut qui vitam excoluere per artes. VIRG.

MOST modern Authors, who have wrote Treatiſes on Huſbandry and Gardening, have, by undertaking the whole Subject, engaged in a Field much larger than their own Compaſs of Experience was equal to; and have been thereby forced to borrow very freely from their Contemporaries or other modern Authors, and that ſometimes without the Sincerity to acknowledge from whom they had their Aſſiſtance.

Reaſons why moſt modern Books of Huſbandry and Gardening are very defective.

In the making Uſe of theſe Helps they have not confined themſelves to Narratives of real Practice and Experiments; and, (not being equal to the Undertaking) have copied the Faults as well as Excellencies of their Authors, and by looſe and idle Hypotheſes, and Relations of pretended Facts and Experiments that never had any Foundation in their own or others Practice, they have amuſed and confounded the Reader, if not the Subject, ſo that Perſons unacquainted with Huſbandry (and for whoſe Uſe alone ſuch Books are ſuppoſed to be wrote) could have no real Benefit from Treatiſes by which they are liable to be lead into ſuch Multitudes of Errors.

This

This makes the Farmers look on moſt of theſe modern Authors as *Arabs* *.

To avoid this I have taken but one Branch of the copious Subject of Huſbandry, *viz.* 'The Ma-'nagement of wet, clayey, ſtiff 'Soils;' ſuch being as it were the Foundation from which almoſt all other Soils are (with the Mixture of different Proportions of Sand) derived; and which if well under-

* The *Spaniards* have a mortal Hatred to the *Arabs*, becauſe they generally impoſe on them, which occaſioned CERVANTES to throw the following ſevere Reflexion on them; 'Si a eſta ſe le puede poner alguna 'obgecion cerca de ſu verdad, no podra ſer 'otro ſino aver ſido ſu Autor Aravigo; ſiendo 'muy propio de los de aquella Nacion ſer mentiroſos.'

ſtood, there will no great Difficulty occur in the Management of other kinds of Land.

Virgil and *Columella* the beſt of the Ancients that have wrote on Huſbandry.

In treating this Part of Huſbandry, I have followed *Columella* and *Virgil* *, as far as they relate to my Subject; believing that in what they ſay on this Head they are much more judicious and better to be relied on than moſt of the Moderns, eſpecially when rightly underſtood; which they have not always been, as I ſhall ſhew

* Digo aſſi meſmo, que quando algun pintor quiere ſalir famoſo en ſu arte, procura imitar los originales de los mas unicos pintores, que ſabe. Y eſta meſma regla corre per todos los mas oficios o exercicios de cuenta, que ſierven para adorno de las Republicas. CERVANTES SAAVEDRA, Tercera parte Capitulo XXV.

ſhew in the Courſe of this Treatiſe.

As to what I have farther advanced, I have taken from my own Obſervation and Experience, or from the known Practice and Experience of Perſons converſant and judicious in theſe Affairs; which I judge to be the beſt way of inſtructing thoſe who are unacquainted with this Subject.------ For I think Hypotheſes and Theories are no more to be admitted in Huſbandry than in Natural Philoſophy.

The firſt Part of this Treatiſe contains ſome Methods for the draining wet clayey Lands, and Directions how to improve them

afterwards by burning the Turf and Clay that is plowed or dug from the Ponds and Ditches which may be requiſite to drain the Ground; and ſome Rules for planting of Willows, Alders, *French* Oziers, *Dutch* Limes and Quince-Trees, in ſuch Grounds as will not pay the Expence of draining and burning.

Beſides theſe there is a particular Deſcription of the Method of burning barren Land in *North-Britain*, and a new Way of denſhering Lands propoſed ſomething in Imitation of that; ſhewing the bad Effects attending the preſent Method to all Landlords.

There

There are alſo ſome Copper-Plates, exhibiting the defective Figure of a Clamp for burning of Clay already publiſhed, with the Figure of a perfect Clamp that will fully anſwer that Purpoſe, and the neceſſary Directions for the proper Uſe of it. I have likewiſe given the Figure of a Plough to make Water-Furrows with, and to plough up Mole-hills, with ſeveral other Inſtruments very uſeful in Huſbandry not before publiſhed, and the parcular Application of them; as alſo Obſervations on the proportioned Quantities of Salts contained in different Earths, the Knowledge of which may be of great Service in Huſbandry.

It is generally agreed that Salts are the great Eſſentials of Vegetation, or what *Hippocrates* calls the τῶ πὸς θειὼν, Fire hid in Bodies, and *Van Helmont* the *Semina Rerum*; ---- if ſo, 'That Earth which con-'tains the greateſt Quantity of 'them muſt be the beſt for propa-'gating Vegetation when it is pro-'perly apply'd;' and of this Sort are all kinds of Clays, which by Experience are found to contain a greater Quantity of Salts than any other Earth; and when burnt wet contain more Salts than when burnt dry; and are therefore a more profitable Manure for the Farmer, as may be ſeen by the Experiment in Chapter X.

Bodies that contain the moſt Salts beſt for Vegetation.

Daily

Daily Experience ſhews that Salts are eaſily wrought upon by Moiſture, which cauſes them to run; for this Reaſon the Lumps of Earth moulder and fall aſunder when the Rain or Dews have moiſtened the Salts they contain. We often find Salts mixed with hard Stones, which crumble to Pieces by being expoſed to the Weather; and Bricks that are not thoroughly dry before they are burnt will moulder when expoſed to the Air.——The ſame holds good in Clay, which runs much ſooner when it is burnt wet than when it is burnt dry; for when it is expoſed to the Air to dry, the Dampneſs of the Night Dews enters the Pores of the Clay which the Sun had relaxed in the Day,

Moiſture affects Salts in all mineral Bodies.

Clays run ſooner when burnt wet than when burnt dry.

Day, and ſets the Salts a running; which is prevented by being burnt wet.

Fire does not deſtroy Salts in Minerals.

The Fire does not evaporate any of the Salts of the Clay, but purifies them by purging away the ſulphurous Matter that is generally mixed with them in the Earth, which fits them the better for the Office of Vegetation.

Acid and Alcali the Cauſe of Vegetation.

HIPPOCRATES and ſeveral of the Ancients thought that the Seminals of all Things contained a *Concordia Diſcors*, or Acid and Sulphur, which cauſed a Fermentation; and BORICHIUS in his Treatiſe *de Hermetis Ægyptiorum & Chymicorum Sapientia* ſays, 'Nullum animal oſtendi poteſt, ex

'ex quo oleum (& hoc eſt anima-
'lium ſulphur) educi nequeat;
'nullum ex quo nihil aciduli
'poſſit ſeperari: nulla planta,
'quæ non vel oleum vehat, vel
'ſpiritum admoto igne flammen-
'tem; nulla quæ non preſſu ſuc-
'cum profundat, ſi ſibi permit-
'tatur in acidum quiddam ſponte
'abiturum.'

'Metallica ut robuſtioris tem-
'peramenti Sulphure & Mercurio
'non carent, equidem hoc pri-
'mum illis cum animalibus &
'plantis commune eſt, quod rara
'minera illa fit, quæ ſulphur
'verum & flammaturum ſolicite
'inquirentibus non offerat; nulla
'quæ ingenioſe in alkohol tenuata,
'& aëri, ſi opus eſt tantillum ex-
poſita,

'poſita, diſtillatione non ſpiritum
'acidulum expromat.'

A Deſcription of Vegetation.

The Office of the Vegetative Principle is to concoct the indigeſted Earth and Salts, which aſcend through the Roots, and to aſſimulate them to the Nature of the Plant; but as the learned MALPIGHI has given a beautiful Deſcription of the Proceſs of Nature in the Vegetation of Plants, I chuſe to give it in his Words as near as poſſible.

'The Egg, ſays he, of the
'Plant being freed from the Ovary
'or Huſk, is committed to the
'Earth; that kind Mother having
'received it into her Boſom, not
'only does the Office of Incu-
'bation,

'bation, but by degrees ſupplies 'what the Seed requires for its 'further Growth; as abounding 'every where with Canals and 'Sinus's wherein the Dew and 'Rain-water impregnated with 'fertile Salts glide like the Chyle 'and Blood in the Arteries of 'Animals.

'This Moiſture, meeting with 'a new depoſited Seed, is perco-'lated or ſtrained through the 'Pores or Pipes of the outer Rind 'or Huſk, on the inſide whereof 'two thick ſeminal Leaves com-'monly lie, which conſiſt of a 'great Number of little Veſiculæ 'or Bladders, that receive the 'Moiſture of the Earth ſtrained 'through the Rind of the Seed,

'which

'which makes a ſlight Fermenta-
'tion with the proper Juice con-
'tained therein before.

'This fermented Liquor is con-
'vey'd by the umbilical Veſſel to
'the Trunk of the little Plant,
'and to the Gem or Bud which
'is contiguous thereto, upon
'which a Vegetation and Increaſe
'of the Parts ſucceeds, &c.'

To make this Work as uſe-
ful as poſſible to every Farmer, I have added a Collection of Ma-
nures and Compoſts that will coſt very little, and may be made Uſe of when he has not a good Stock of Wood or Peet to burn Clay or Turf with; and if this Treatiſe ſhould not prove ſo compleat

compleat as the Reader expects, I desire he will lay the Fault to the Author, and not the Subject; as a great Man did once before. 'Y si algo bueno en ella 'faltare, para mi tengo, que fue 'por culpa del galgo de su Autor, 'antes que por falta del sujeto.'

A NEW

A NEW METHOD OF Improving wet LAND.

CHAP. I.

The Method to drain the Ground when it lies almoſt level.

——— *at ſceleratum exquirere frigus,*
Difficile eſt. ——— VIRG.. Geor. lib. 2.

WHEN there are no Springs, and the Field encloſed with a Hedge, make a Ditch four Foot deep and five wide, within a Yard of the Hedge, round a Field of ten or twelve Acres; and ſo greater or leſſer, in Proportion to the Size of the Field. The Ditch ſhould be four Foot wide at Bottom, and increaſe gradually

The Method to prevent Buſhes from over-running a Field.

dually 'till it comes to the Surface of the Ground, which will hinder the Sides from falling in with the Froſts and Rains.

This will help to lay it dry; and prevent the Hedge from over-running the Field with Buſhes, that conſtantly deſtroy the Graſs, and coſt a great deal of Trouble and Expence to mow and grub.

Where the Field lies lower than thoſe round about it, the Water that runs off them will naturally over-flow this, and keep it always ſowre and cold; ſo that the Product hardly pays the Repairs of the Hedges, far leſs the Rent. The above-mentioned Ditch will receive that Water in a great meaſure, but if it ſhould not then make a Pond (See Chap. 9.) in that part of the Field which is moſtly over-flow'd, to contain it.

Great Care ſhould be taken to keep the Ditch and Pond clean and free from Weeds; the beſt time for this Work is in *July*, when the Weeds are in Flower before

Beſt time to clear Ponds and Ditches of Weeds.

before they ſeed; for which ſee the Figure of the Inſtrument with its Uſe in Plate 6. Chap. XI. for if this Work is neglected, it will be making bad worſe.

———*ſic omnia fatis*
In pejus ruere, ac retro ſublapſa referri.

The cheapeſt method to make Ponds or Ditches is to plough them up, if the Ground will bear the Cattle; and cut the great Tendons that run from the Aſh and the Elm in the Hedge-Rows with a Mattock before the Plough. An Eaſy Way to make Ponds and Ditches.

The firſt Spit or Coat will burn eaſily when dry, becauſe it is generally full of ſmall Roots, and make a good Manure for the Field. (The Method of burning it ſee in Chap. V.) But the other Spits that are not ſticky, in caſe Cord Wood or Peet do not exceed twelve Shillings a Cord, ſhould be burnt wet in a Clamp; ſee Chap. VI.

When Wood or Peet exceed twelve Shillings, then fill up what Hollows there are in the Field with Part of it; and make the Remainder into a Mixen, ſee Chap. X.

CHAP.

CHAP. II.

The Method to drain the Ground when it lies very uneven.

Sæpe etiam immenſum cœlo venit agmen aquarum. VIRG. Geor. lib. 1.

THE ſame Method is to be obſerved here as in Chap. I, with regard to the Ditch round the Hedge, the Pond, and burning the firſt Spit for the Benefit of the Field.

A hanging Level beſt to carry off Water.

The other Coats or Spits ſhould be employed to make the Field as near as poſſible on a hanging Level, (as the Farmers call it) if the Ground will admit of it with a ſmall Expence; when that cannot be done, fill up the Places where the Water ſtagnates moſt, otherwiſe it will require much more Work to keep it dry by multiplying the Ditches; for till the Water is carried off the Snake will lie in the Graſs.

The propereſt Places for Water-Furrows.

The ſureſt way to lay the Field dry, is to meaſure the different Hollows in it with a Water-Level, and make the loweſt of them a Pond for the Receiver into which the Water is to be brought from the reſt of the Field, in this manner, *viz.* After a great Rain, mark the Courſes of the Water as exact as poſſible; and there make Water-Furrows to carry it off into the Pond. See the Method of making Water-Furrows, and the Plough to make them with, in Chap. XI. Plate VI.

As to the Dimenſions of Water-Furrows every Body's own Judgment muſt direct them; for they depend on the Situation of the Field, and the Quantity of Water that is to be carried off.

In caſe they are made too little the firſt Time enlarge them the next; for a wiſe Man may be miſtaken, but then he will be ſure to change his Meaſures, which a Fool never does, as the *Spaniards* ſay; *Il ſabio muda conſcio, il neſſio no.*

Rather

Rather than multiply the Water-Furrows, it will be cheaper and better to make a Ditch in the Middle of the Field to receive Part of the Water; which will keep the lower Part dry, and ſave the Expence of the frequent cleaning the Water-Furrows, which, when ſmall, are very apt to fill up.

An Inconvenience attending ſmall Water-Furrows.

CHAP. III.

The Method to drain the Ground that has got Springs in it.

New Method of dry ditching.

DRY-ditching is found the beſt Method to drain Lands that have Springs in them, when performed in a proper Manner; which is as follows, *viz.* find each Spring in the Field, and over it dig a Well ſix Foot deep and ſeven over, than get ſome Sticks nine Foot long, and make Holes in the Sides of the Wells eighteen Inches from the Surface of the Ground, ſix Inches deep, with an iron Pitcher to fix the Sticks in. Then take Heath or Broom, and lay it thick acroſs the Sticks ſo as to prevent any Earth from falling through, and after this lay on the Turf even with the Surface of the Field.

From each Well make a Ditch to the Place where you deſign to carry off the Water, two Foot wide and three deep, and

and cover it in the ſame Manner as the Wells.

Where Heath can be had it is better than Broom, becauſe it laſts much longer, and lies cloſer together, by which it prevents the Mould from tumbling through to the Wells or Ditches.

If the Field is encloſed obſerve the ſame Method of ditching it round as in Chap. I; and in making the dry Ditches, take as many Springs into each Ditch as the Level of the Ground will allow; but be ſure to make a Well over each Spring, otherwiſe, when there comes a great fall of Rain, they will be apt to break thro' their Cover, like *Horace*'s Dropſy Lib. II. Car. 2.

Creſcit indulgens ſibi dirus Hydrops,
Nec ſitem pellit, niſi cauſa morbi,
Fugerit venis, et aquoſus albo
Corpore languor.

When

When the Springs are very ſtrong, there is a Neceſſity of making a Pond to receive the Water, and even that will be apt to overflow; in which caſe there is no other Remedy but making a Water-Furrow in the adjacent Field to carry it off, if it be your own; if not your Neighbour will hardly refuſe to let you make a dry Ditch through his Field, becauſe he may want the ſame Favour from you, unleſs he be over ſcrupulous about theſe two Words *mine* and *thine*, which have been the bone of Contention betwixt all Mankind ever ſince the Golden Age; as is beautifully deſcribed by *Cervantes Saavedra* *.

But

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* ‘ Dichoſa edad, y ſiglos dichoſos, aquellos a quien ‘ los antiguos puſieron nombre de dorados, y no porque ‘ in ellos el oro (que en eſta nueſtra edad de hierro tanto ‘ ſe eſtima) ſe alcançaſſe en aquella venturoſa ſin fatiga ‘ alguna, ſino porque entonces los que en ella vivian, ‘ ignoravá eſtas dos palabras de TUYO, y MIO. Eran ‘ en aquella ſanta edad todas las Coſas comunes, a nadie ‘ le era neceſſario para alcançar ſu ordinario ſuſtento to- ‘ mar otro trabajo, que alçar la mano, y alcançarle de ‘ las robuſtas enzinas que liberalmente les eſtavan com- ‘ bidando con ſu dulce y ſazonado fruto, *&c.*’

But if the Springs riſe very thick as well as ſtrong, it will hardly pay the Charge of dry ditching. The beſt improvement that can be made in that caſe is to plant it with Willows, Alders, or *French* Oziers, which will grow exceedingly; if it be in a Country where Hoppoles are wanted, the red Willow or Alder is beſt; but if deſigned for Baſket-Makers, the *French* Ozier will fetch moſt Money.

Grounds will not always pay the Expence of dry ditching.

If the Soil be boggy it will do well for Quince-Trees, which yield as good profit as any ſort of Fruit; the Method of planting them ſee in Chap. VIII.

Boggs good to plant Quince Trees in.

CHAP.

CHAP. IV.

The Method of draining common Fields, or Marſhes.

Naturamque ſequi. LUCAN.

Wet Land in common Fields ſhould be divided.

WHEN Land lies wet in common Fields or Marſhes, the moſt certain way to drain it is to divide it into Parcels of four, ſix, eight, or ten Acres, as will beſt ſuit the Situation or number of Cattle deſigned to paſture in it, or the Tenements to be built on it.

It is never good to force Nature.

The chief Thing to be obſerved is the Situation of the Land; for Nature with a little Art to help her is eaſily led, but when forced will be ſure to ride reſtive. So that the only View ſhould be to follow her, and never ſtrive to make her follow.

Where making of a Ditch round ten Acres will lay them dry, there is no occaſion

caſion to make any more; but if the Ground lies very uneven mark the Places where the Water ſtagnates moſt, and make a Ditch to carry it off in every Acre if requiſite.

In common Fields the out-ſide Ditches ſhould be wide enough to keep the Cattle in.

There can be no poſitive Rule to aſcertain the exact Number and Demenſions of the Ditches, only be ſure to make them large enough to keep the Cattle in.

In each Incloſure the out-ſide Ditches ſhould be ſix Foot wide and five deep; and the croſs Ditches muſt be made as the Situation of the Ground requires, of which every Proprietor will eaſily judge.

Advantage of Willows in common Fields.

It will be very proper, as well as advantageous, to plant the Sides of the large Ditches with Willows and Alder, (ſee Chap. VIII.) which ſerve to ſhelter the Field and Cattle, beſides ſtrengthening the Banks; and the Ditches may be ſtored with Jack and Roach, which will thrive exceedingly in them; an Acre of Water will feed one hundred Jacks.

Jack thrive in large Ditches.

In

Dutch Lime Tree beſt for Marſhes near the Sea.

In Marſhes that are brackiſh and near the Sea, the Banks ſhould be planted with the white Dutch Lime-Tree, which will grow better in ſuch ſort of Land than a Willow.

Obſervations on the different Quantity of Rain and Dew that fall in a Year in diſtant Counties.

The following obſervations may be of ſome advantage to the Curious in draining of Land, *viz.* Mr *Townley* meaſured the Quantity of Rain that fell in one Year at *Townley*, in *Lancaſhire*, which amounted to 42 Inches and a half; and Dr *Derham* obſerved the Quantity of Rain that fell in that Time at *Upminſter*, in *Eſſex*, which came to no more than 19 Inches and a Quarter. Dr *Hales* ſays, That the Quantity of Rain and Dew that fall in this Climate *communibus annis* is 22 Inches, and that the Earth evaporates in one Year 9 Inches and a Half, from which 3.39 Inches are to be deducted for the Dew that circulates daily, and there remains 6.2. Inches, which ſubſtracted from the 22 Inches, and there will remain near 16 Inches to ſupply the

The Quantity of Rain ſufficient for Vegetation.

Earth

Earth for Vegetation, *&c.* But by Mr *Townley*'s Obſervation it is plain there were 35 Inches of Rain-water left on the Earth in *Lancaſhire*, (allowing 7 Inches for Evaporation) 19 of which muſt be carry'd off to ſupply the Springs and Rivers, if 16 are ſufficient for Vegetation.

Nature ſuits the Quantities of Rain to every Country.

By this we ſee the great Care that Providence takes to adjuſt Things to different Climates and Countries; for if ſuch a Quantity of Rain was to fall in a champain Country, as fell in *Lancaſhire*, it would quite deſtroy it; when ſuch a hilly Country as that could hardly do without it *.

The Uſe to be made of knowing the Quantity of Rain that falls in a Place in one Year.

Theſe Obſervations ſhew, that by knowing the Quantity of Rain that falls in ſuch or ſuch a Place for one Year, and the Quantity ſufficient for Vegetation, the Ditches and Ponds may be made

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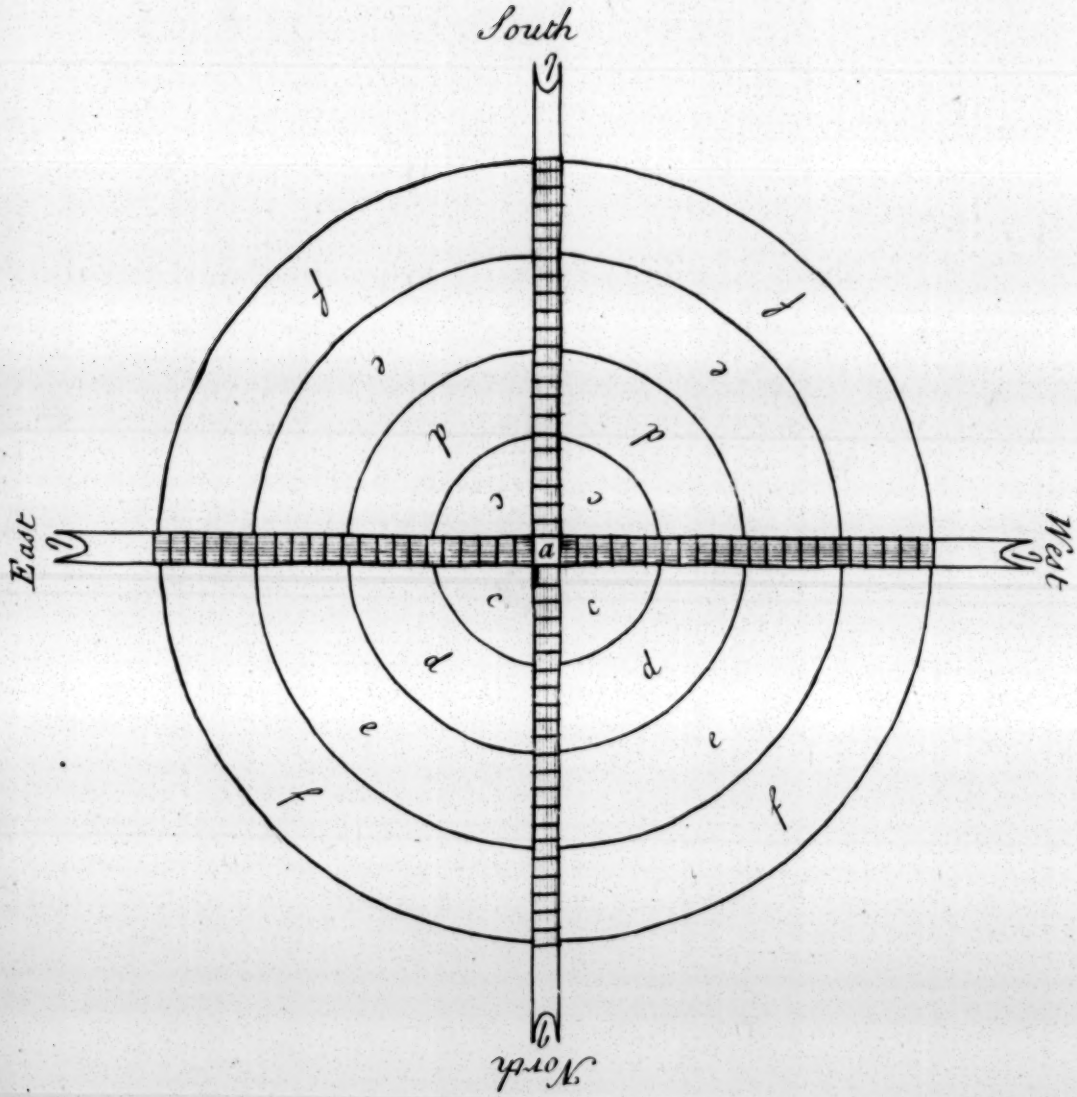
* *Quiquid magnam utilitatem generi adferret humano, id non ſine Divina bonitate erga homi homines fieri arbitrabantur.* CICER. de Nat. Deorum.

made to carry off the ſuperfluous Water to that Proportion; and when that is done, and the Ground manured with the Aſhes of the Turf, that comes out of the Ditches, it will be like *Virgil*'s Meadow.

Quæque ſuo viridi ſemper ſe gramine veſtit,
Nec ſcabie & ſalſa lædit robigine ferrum.

Plate 1. fronting Chap. V. p. 17



The Figure of a Platform for burning dry Turf or Mole Hills.

CHAP. V.

A new and cheap Method of burning dry Turf or Mole-hills.

Prima ferè vota, & cunctis notiſſima Templis,
Divitiæ ut creſcant. JUVENAL.

THERE is nothing that can enrich a Farmer ſo ſoon as the Improvements he may make in his Lands by burning them, which ſeems at this Day to be very little underſtood, and much leſs practiſed. Burning of Turf enriches the Farmer.

As Fire evaporates the fluid Particles of the Earth, and reduces the Salts to a leſs Compaſs, ſo it has been found by long Experience that the Aſhes of Turf or Mole-hills (and indeed almoſt all Aſhes) have been of very great Service in the Improvement of Land; eſpecially ſuch as lies wet, to which I confine my ſelf. Aſhes of greateſt Service to wet Lands.

———*neve*
Effætos cinerem immundum jactare per agros. VIRG.

The Effect of Fire on Bodies.

The Vulgar Notion is that Fire makes Salt, becauſe they taſte a Salt in Aſhes which they could not do before the Body underwent the Operation of the Fire; but Fire cannot conſtitute or make Salt from any Earth Vegetable or Mineral; it only ſeparates or brings it to a leſſer Compaſs; for all Principals are unalterable.

Four Channels requiſite to burn Turf.

In making of Ditches or Ponds when the firſt Spit is ploughed or dug up and thorough dry, or after ploughing up Mole-hills and they are dry, dig four Channels as in Plate 1, at b. b. b. b. thirty Foot long each, ſix Inches deep, and ſix Inches wide, and join them in the Middle at *a*, where they cut each other, and cover them over with Bricks or Slates, except in the Middle at *a*, which muſt be left open for a Chimney, and is to be built in this Manner, *viz.* over the four Bricks which were laid

Method of making a Chimney to burn Turf.

laid at *a*, lay four more in parallel Lines, which continue till they are carry'd up to nine Foot high, and then lay ſome looſe Turf or Mole-hills round the Chimney at c.c.c.c. eight Foot high to keep it from tumbling down; and round the Turf at d.d.d.d. put twenty-five good Wood Faggots up an End, and over them lay ſome Cord-Wood, but not ſo high as the Top of the Chimney, and from the Faggots lay one lengthways on each Channel pointing towards b.b.b.b; then take ſome more Turf, or Mole-hills, and lay round about the Faggots at e.e.e.e, till the Faggots are covered that were laid lengthways on the Flews towards b.b.b.b, and till the Cord-Wood is cover'd two Foot thick. Then obſerve to which of the four Channels at b.b.b.b, the Wind blows, and and open it to ſet Fire to the Faggot; for which always chuſe the Morning, becauſe the Heap requires a little extraordinary attendance at firſt lighting.

Quantity of Wood requiſite to burn a Heap of Turf.

The Heap to be lighted facing the Wind in a Morning.

Before the Fire is lighted, ſtop up all the Holes in the Sides and Top of the Heap where the Heat may get out (except at the Chimney) with ſmall Pieces of Turf, and clear out the Channels.

Method of ſupplying the Heap.

Half an Hour after it is lighted the Top will begin to ſink, which fill up gradually with the thineſt and dryeſt of the Turf or Mole-hills as the Fire breaks through: This Method is to be continued for the firſt Day and Night, becauſe it will want a little ſupply every Hour, or leſs; after that Time thick Turf or Mole-hills may be laid on where the Fire comes through; but it muſt be attended Day and Night.

The Channels to be extended, and Chimney raiſed as the Heap increaſes.

As the Heap increaſes to f. f. f. f. extend the Channels at b. b. b. b, always three Foot on the Outſide of the Heap, and keep them covered with Bricks as far as the Heap ſpreads; and at the ſame time let the Chimney be always raiſed at leaſt a Foot above the Heap.

It

It will burn faſteſt at the Top if it be not prevented by pitching ſome Holes in the Sides and Bottom to draw the Fire that Way; and ſtop the Channel which is oppoſite to the Place where it burns leaſt, till ſuch time as it burns all alike, and then open it again. The Way to make the Heap burn even.

While this Method is followed there is nothing can hurt the Fire except exceſſive Rain; in which caſe lay a good thick Cover of Turf or Mole-hills on it, to prevent the Rain from getting to the Fire. Way to prevent Rain from extinguiſhing the Fire.

There may be half a Dozen of Heaps burning at the ſame time, for one Man can look after them all, which will ſave conſiderably to the Farmer. Number of Heaps to be burnt together.

When the Heaps are burnt, lay fifty or ſixty Load (twenty-five Buſhels to a Load) on an Acre; but in caſe the Ground is full of Ruſhes or Green-weed, then a hundred Load is little enough. Quantity of Aſhes neceſſary for different Lands.

Effect of Aſhes on Meadow and Corn Lands.

The beſt Way to ſpread it is with a Shovel out of the Cart, and afterwards brake the Lumps, and roll it two or three times on Paſture and Meadow Lands, where it produces the white Clover, of which Cattle are very fond; and when laid on a Fallow for Winter Corn it prevents the Seed from rotting with the cold Rains, and the Worm from eating it.

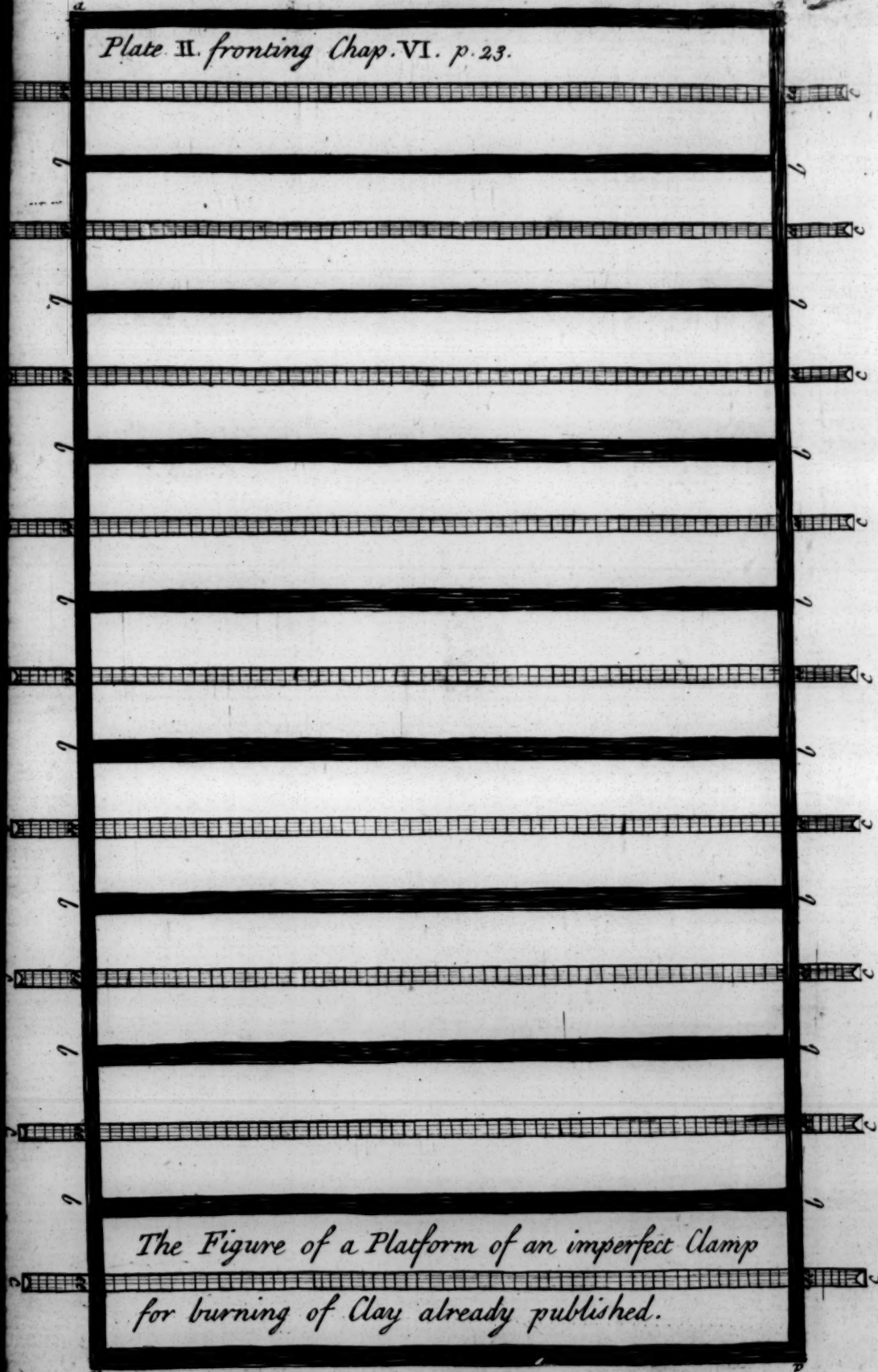
Beſt time to lay Aſhes on Lands.

It may be laid on Meadow or Paſture any time when the Graſs is off, and on a Fallow before the laſt ploughing; which will make them reſemble *Horace*'s Farm,

——*Hinc tibi copia*
Manabit ad plenum benigno
Ruris honorum opulenta cornu.
HOR. lib. I. car. 17.

CHAP.

Plate II. fronting Chap. VI. p. 23.



The Figure of a Platform of an imperfect Clamp for burning of Clay already published.

CHAP. VI.

A new Method of burning wet Clay in a Clamp.

Fly no Opinion, Friend, becauſe 'tis new;
But ſtrictly ſearch: And, after careful View,
Reject if falſe, embrace it if 'tis true.

SOME Author, in a late Pamphlet, has publiſhed the Figure of a Clamp for burning of Clay, and the Method to burn it, which has led People into a great Error, as well as loſs; for it is impoſſible to burn Clay as he has directed; which he would eaſily have been convinced of had he ever tried the Experiment, or even have thought rationally about it.

The bad Conſequence of wild Schemes.

It is true he delivers it at Second-hand; but I will take upon me to ſay, That he acts the Part of *Phantaſtes*, Servant to *Geographus*, who, the Poet tells us, travelled farther beyond the artick Circle than ever his Maſter durſt, as I ſhall prove immediately.

Stories at Second-hand generally falſe and imperfect.

Detection of the imperfect Figure of a Clamp lately published.

The Figure of his Clamp is in Plate II, where the Channels at C, run the Breadth of the Clamp and three Foot more on each Side the Wall at E. E. Now ſuppoſe the Channels to lie Eaſt and Weſt, and the Wind to blow from either of theſe Corners, when the Clamp is lighted, then it may chance to burn the Wood out, if the Wind keeps an Hour or two in either of them; but if the Wind change to North or South, there would be an end of burning.

An impoſſibility in peforming the Directions given by a late Author for burning of Clay.

Beſides he tells us to build the croſs Walls firſt, and then the ſide Walls next the Wind (how does he know whether the Wind will blow next either of the Sides?) "leaving the other Side open "till the Fire is *well lighted*,"— "and "then you may raiſe up that Side of the "Clamp which lies furtheſt off from the "Wind." This laſt Operation is impoſſible to be performed by any Man on Earth after the Clamp is *well lighted*; becauſe

cauſe the Smoke and Heat would kill that Perſon in the Execution of it.

Another way to render his Scheme ineffectual is this——he directs *Four Inches* 'of dried Clay to be laid on the top of 'the Combuſtibles before they are light-'ed." In this Caſe the whole Strength of the Fire would be ſpent in one Hour's time without burning that *four Inches of Clay*; for it requires ſix times that Quantity of Clay to be laid on before the Clamp is lighted.

The Ignorance of a late Author on the Nature of Fire.

When Deſcriptions are general or confuſed they are very apt to lead People into Miſtakes, and this hinders Gentlemen and Farmers from trying ſeveral Experiments which, if thoroughly underſtood, would be of great Service to Huſbandry.

Why Agriculture is not more improved among the Moderns.

The following Deſcription of a Clamp, and the Method of burning it, is ſo plain, that I hope the meaneſt Capacity will underſtand it.

It is caculated to burn 200 Load.

When

Proper Place to make a Clamp in.

When the Place is fixed on for the Clamp, which ſhould always be in or near the Field where the Aſhes are to be laid, level forty-two Foot of the Ground in length, and twenty-two in breadth, on which mark out with a Line

Method of cutting the Channels for a Clamp.

ſixteen Foot long nine Channels four Foot diſtant from each other, ſix Inches deep and ſix Inches wide (ſee Plate III. Fig. 1.) Then extend the Line to thirty-ſix Foot in length, and make three Channels four Foot diſtant from each other, acroſs the other nine of the ſame Breadth and Depth with them. (ſee Plate III. Fig. 2).

Proper Place to lay the Turf that comes out of the Channels.

Lay the Turf and Mould that is dug out of the Channels in the Middle of the Squares which they make, and then cover the Channels over with Bricks or

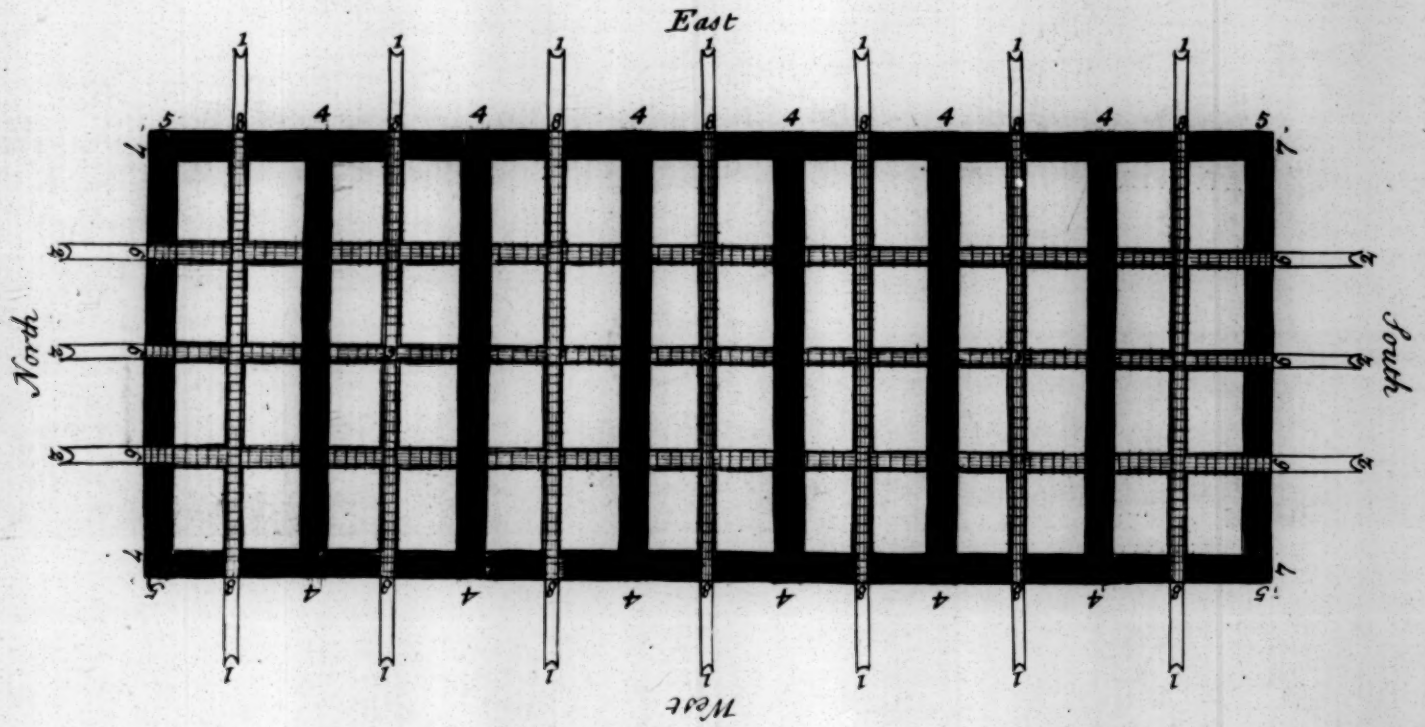
Method of laying the Bricks on the Channels.

Slates as cloſe as poſſible, (except on the three Places where the Channels cut each other at Fig. III. Plate 3. which muſt be left for Chimneys to attract the Air from all the Channels) and after the

Bricks

Plate III. *to be placed in the Middle of Chap.* VI. *Page* 26.

The Platform of a perfect Clamp for burning of wet Clay. 1. The Channels in the Breadth. 2. The Channels in the Length. 3. The Squares to be carried up for Chimneys to atract the Air. 4. The crofs Walls. 5. The end Walls. 6. The Holes left in the end Walls to set fire to the Clamp in case the Wind should blow South or North. 7. The side Walls. 8. The Holes in the side Walls to set fire to the Clamp in case the Wind blows East or West.



Bricks are laid, ſhovel the Turf and Mould in the Middle of the Squares to the Sides of the Bricks, to keep them from tumbling into the Channels.

The Danger of having the Channels ſtopt.

For if any of them ſhould tumble in or any Dirt ſtop up the Channels it will be very difficult to make that Part of the Clamp burn even.

Method of building the Croſs-walls.

When the Bricks are laid, build a Wall between each Channel three Foot high of the largeſt of the dry Turf or Mole-hills. (See Plate III. Fig. 4.) The Walls need be no thicker than will ſupport them to that Height.

Method of building the End-walls.

Then build the two End-Walls one Foot thick with wet Turf or Clay three Foot high, (ſee Plate III. Fig. 5.) and leave a Hole nine Inches ſquare over each Channel (ſee Plate III. Fig. 6.) to ſet Fire to the Clamp, in caſe the Wind ſhould be in that Corner when it comes to be lighted.

After

Manner of raiſing the Chimnies.

After this take ſome Bricks and raiſe the three Chimneys over Fig. 3. by laying the Bricks parallel to each other, three Foot above the Walls, (ſee Plate IV. Fig. 2.) and round the Chimnies lay ſome Clay to keep them from tumbling down, when the Faggots and Cord-wood are laid in.

Quantity of Bavins or Faggots neceſſary for the Clamp.

When the Chimneys are finiſhed lay ſome Straw, Fern, or Heath, over the Channels between the Walls, and crowd as many Bavins or Faggots over the Straw, Brakes, or Heath, as can lie within the Walls.

Method of building the Side-walls.

Then build up both the Side-walls (Fig. 7.) exactly as the End-walls, leaving a Hole nine Inches ſquare (Fig. 8.) over each Channel as in them.

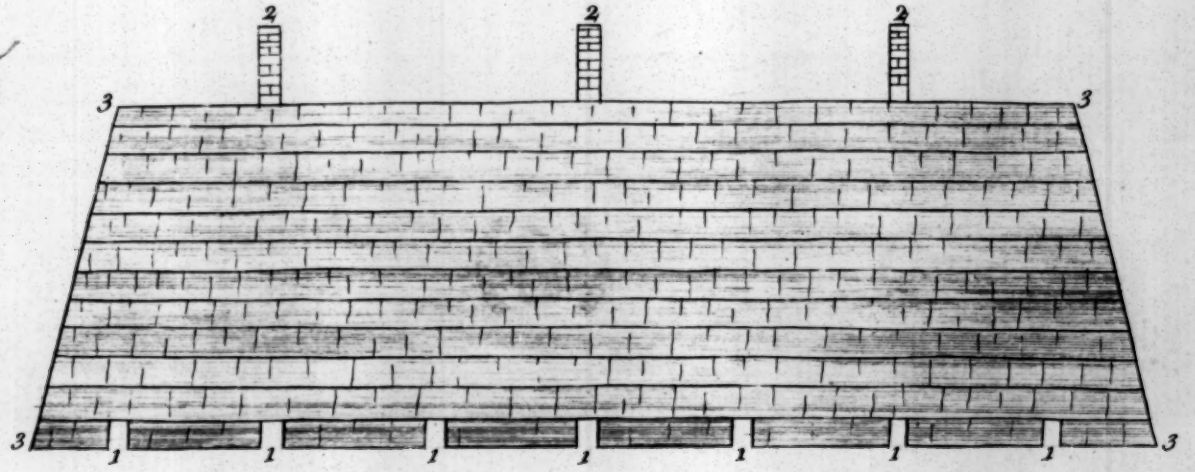
Quantity of Cord-wood or Peet wanted for the Clamp.

After this, lay three Cord of large Wood (no Matter whether green or dry) or Peet over the Bavins or Faggots, as cloſe as poſſible, to keep the Clay from tumbling

Plate IV. *to be placed at Page* 28. *Chap.* VI.

The upright Figure of a perfect Clamp for burning of wet Clay.

1. The Holes over the Channels to set fire to the Clamp. 2. The Chimneys for atracting the Air from the Channels. 3. The manner the outside Walls are to batter in to prevent them from falling.



tumbling in on the Faggots before they are thoroughly lighted.

In caſe there be any green Buſhes or Brakes, or Ruſhes, near the Place that can be ſpared, fill up the Holes between the Wood with them, and that will prevent the Clay from tumbling in better than any thing elſe.

Green Buſhes or Brakes beſt to lay on above the Cord-Wood.

When the Holes between the Wood are ſtopt, raiſe the out-ſide Walls and End-walls as high as the Logs or Peet lie, and cover the Clamp all over two Foot thick with large Pieces or Spits of Clay, (the larger the better) and fill up all the little Holes between the large Spits of Clay with ſmall Pieces of Turf or Clay, to keep the Heat in.

The Clamp ſhould be covered two Foot thick with Clay before it is lighted.

Then get ſome wet Clay and Mould, beat together like Mortar, and plaiſter the Walls all round the Clamp for three Foot from the Ground; for they will all fall in to that Height.

Method of plaiſtering the Walls of the Clamp.

After

The Channels muſt be extended three Foot without the Walls.

After this open all the Channels round the Clamp three Foot from the outſide Walls, (from Fig 6. and 8. to Fig. 1.) (ſee Plate III.) but there is no occaſion to cover them over with Bricks, and get twenty Load of Clay laid round the Clamp, to be ready to throw up as the Fire ſhall break through.

Method of lighting the Clamp.

Before the Clamp is lighted obſerve how the Wind blows, and ſtop up all the Holes over the Channels quite round the Clamp, except thoſe that face the Wind, where ſet fire to the Straw or Brakes under the Bavins or Faggots with a Candle or Fire-brand; for which chuſe the Morning.

The Holes over the Channels to be ſtopped after the Clamp is lighted.

In half an Hour's time the Bavins or Faggots will be lighted, when all the Holes over the Channels quite round the Clamp are to be cloſe ſtopt up, and every Crack where the Smoke comes out in the Walls is to be plaiſtered with wet Earth or Clay.

After

After the Clamp has been lighted an Hour the Fire will break through the Top, and the Clay that was firſt laid on will ſink down as the Faggots conſume; but there is never any Clay to be laid on but where the Fire breaks through, and that at great Leiſure.

No Clay to be laid on but where the Fire breaks out.

Before Night it will be all even with the three Foot Walls, when a Board ſhould be laid a-croſs it for the Men who attend to ſupply it without any danger of falling in amongſt the Fire; and then all the Clay that lies on the Croſs Walls ſhould firſt be thrown down to fill up the Places where the Fire comes through, before freſh Clay is thrown up.

Method of managing it when the Top falls in.

In the Night the Places where the Fire breaks through will appear white, and in the Day black, which ſerve as a Guide to lay the Clay up.

Signs to know where the Fire breaks out.

Before

Method to make the Clamp burn even.

Before Morning the twenty Load of Clay will be burnt, when the ſame Method is to be continued— but if any Place of the Clamp happens not to burn ſo faſt as the reſt, pitch a Hole or two in it with an iron Pitcher or Crow, and ſtop up the Channel that is oppoſite to it till it burns alike with the reſt.

Chimneys and Walls to be always raiſed half a Foot above Middle of the Clamp.

While the Clamp is burning keep the Channels free from Dirt, and raiſe the Chimneys and the Outſide-walls at leaſt half a Foot above the Middle of the Clamp always, and let the Walls be conſtantly plaiſtered where the Heat comes through, and make them incline or batter in a little to the Center.

The Air puts the Fire out.

There is an abſolute Neceſſity to attend it Day and Night, to prevent the Fire from being expoſed to the Air, which would certainly put it out.

There is nothing can hurt the Clamp but

By obſerving the above Directions there is nothing but a Deluge of Rain to ſtop up

up the Flews that can hurt the Clamp, which may be prevented by making it on a riſing Ground; and then there is nothing can do it any Miſchief, but Careleſſneſs; for I ſaw a Clamp burnt in *November*, when there were not ſix Hours of fair Weather together all the Time it was burning. Careleſſneſs about theſe Directions.

The following is an Account of the real Expence of burning two hundred Load of Clay, viz.

	l.	*s.*	*d.*
To 200 Bavins, Faggots, or any other ſmall Wood	0	18	00
To three Cord of Logs or Cordwood - - - - - -	1	10	00
To digging and throwing up 200 Load of Clay at 4 *d.*	3	6	08
To Straw and Carriage of 750 Bricks - - - - - -	0	7	00
	6	1	08

Expence of burning 200 Load of wet Clay.

N. B. *There is nothing can be charged for the Bricks except the Carriage, becauſe they are the better for burning.*

A Farmer can burn it cheaper than the Eſtimate.

The above Eſtimate is made at the higheſt Rate it can bear; for a Farmer that has got Materials and Hands to dig it or plough it may really burn two hundred Load for three Guineas at moſt; as any Gentleman, who is converſant in Huſbandry, will ſoon be convinced of by the above Eſtimate.

The Clamp ſhould be watered after it is burnt.

When the Clamp is burnt as high as a Man can throw a Spit up, which is twelve Foot, and the Fire burns quite through the Top and Sides, (which will be eight Days after they have done throwing up Clay) then pour about forty Pails of Water on the Top of it, and that will help the Aſhes to run the ſooner.

Clay that is not well burnt how to manage.

Before the Aſhes are carried out into the Field ſtrip the Top and Sides of the Clamp of all the Pieces that are not thoroughly burnt, which lay in a Heap and burn as directed in Chap. V, for dry Turf and Mole-hills.

Thirty

Thirty Load of the Aſhes of the wet Clay (twenty-five Buſhels to a Load) will be ſufficient for an Acre of Paſture or Meadow-Land, unleſs they be full of Greenweed, Ruſhes, Horſe-prickle, Fox-tail, *&c.* and then fifty Load may be laid on, in the ſame Manner as directed for the Aſhes of dried Turf and Mole-hills, in Chap. V.

What Quantity of Aſhes are ſufficient for an Acre of Paſture Lands.

This Manure ſhould be laid on in the Winter, becauſe it will deſtroy all noxious Weeds or Plants that theſe wet Lands generally produce, and likewiſe the Sword-worm, and all other kinds of Inſects that injure the Paſture. It generally produces the white Clover.

Clay Aſhes deſtroy the Weeds and Inſects that are natural to wet Soils.

When it is uſed for a ſtiff clayey or loamy arable Land (for which Sorts only it is proper) then fifty Load ſhould be laid on an Acre.

The Quantity of Aſhes requiſite for arable Land.

If it is intended for Wheat it ſhould be laid on about *Michaelmas*, before the laſt ploughing; but for *Lent* Corn, in the

Beſt time to lay the Aſhes on Arable Land.

Spring, before the laſt ploughing; and in both Caſes plough it in but ſhallow, to prevent its being bury'd too deep before it is well incorporated with the Soil.

Clay Aſhes good for Turnips.

But the beſt Way for arable Land is to burn the Clay in *May* or *June*, and lay the Aſhes out upon a ſummer Fallow as ſoon after as may be for a Crop of Turnips; for which this Amendment is particularly beneficial by deſtroying the Fly, and producing great Crops beyond Lime or any other Sort of Manure.

Ridging and Water-Furrowing the Land fits it for Cattle to feed Turnips off.

In caſe any Farmer ſhall think this ſort of Land not ſo proper for Turnips, or feeding them off, on account of its being too wet for that Purpoſe; that Inconvenience may be eaſily avoided by ridging and water-furrowing the Land when the Turnips are ſown, which will keep it dry enough to feed Sheep on; as is frequently experienced on the cold clayey Soils in *Northamptonſhire*, *Leiceſterſhire*, *Suffolk*, and other Counties.

But

But in caſe any extraordinary wet Seaſon ſhould render it impracticable to feed them off, the Sheep, or other Cattle, may be confin'd under ſome Shed, or in ſome Pen, and the Turnips pulled up and carried to them; and if any are left by the fatting Cattle they will be uſeful to feed Hogs with.

In a very wet Seaſon, fatting Cattle ſhould be penned up in a Shed.

During the time that Sheep are fatting on Turnips, their Pen ſhould be litter'd with Straw to keep them from the wet Ground;

Virgil's Direction for fodering Cattle.

Et multa duram ſtipula filicumque maniplis
Sternere ſubter humum, glacies ne frigida lædat
Molle pecus; ſcabiemque ferat, turpeſque podagras.

VIRG. Geor. Lib. 3.

and after ten Days feeding on the Turnips they ſhould have a Rack or Cratch with a ſmall Quantity of old dry ſweet

Hay, always ſtanding by them, which will greatly contribute to their Health and feeding kindly.

Farmers are long of changing an old Habit unleſs by the Example of Noblemen and Gentmen.

Nothwitſtanding the above Method of burning Clay in a Clamp is ſo eaſy and plain, and of ſo great advantage to wet cold Lands, it is not to be expected that many Farmers will venture to burn it before their Landlords ſet them an Example; but if once Noblemen and Gentlemen give them a Pattern, they will ſoon copy. For it may juſtly be applied to the Farmers what *Pliny* remarks of the Peoples following the Manner of their Prince. *Pliny*'s Remark on the Humour of the People in his Time.

'Flexibiles in quamcunque partem ducimur à Principe atque ut ita dicam ſequaces ſumus. Huic enim cari, huic probati eſſe cupimus, quod fruſtrà ſperaverint diſſimiles. Eoque obſequii continuatione pervenimus, ut prope omnes homines unius moribus vivamus.

Clay Aſhes contain more Salts than thoſe of Loam.

The Aſhes of Clay, when burnt wet, are much better than thoſe of Mole-hills or Turf; for Experience ſhews that a Peck

Peck of Clay contains twice as much Salt as a Peck of Loam, and four times as much as the ſame Quantity of Sand.

From this it might be imagined that a clayey Soil was the beſt for Plants, which is contrary to all Experience; for the Parts of the Clay, being cloſe knit together do not ſo eaſily give out their Salts as a looſer Mould; nor can the tender Fibres of the Plants make their way through it in ſearch of their Food.

Reaſon why Clay does not produce as good a Crop as Loam does.

Mr EVELYN in his practical Diſcourſe on Earths ſays, 'that Clay when dry'd 'as ſeen through a Microſcope conſiſted 'of exceeding ſmooth round Sands of 'ſeveral opacous Colours;'——and 'Mr '*De la Quintinie* attributes all the Dif-'ference we find in Soils to the different 'Quantity of Sands mixed in them.'

Mr *Evelyn*'s Opinion of Clay.

I confeſs I am of a different Opinion, and think that Sand of itſelf could hardly conſtitute ſuch a ſtiff glutinous

Reaſons againſt Mr *Evelyn*'s Opinion.

Body as Clay; for we never find any Springs in Clay, but commonly in Sand or Gravel, both which Experience ſhews to be of a very different Nature from Clay. ——Sand and ſmall Gravel are often us'd with great Succeſs as a Manure for Clay, which they attenuate and open much better than Dungs.

Clayey Lands require a Manure of a contrary Nature.

Any Manure that is laid on Stiff clayey Lands, ſuch as Horſe-Dung, Cow-Dung, Sheeps-Dung, or any ſort of Dungs that do not change the Nature of the Soil, ſo as to render it looſe and open, laſt but a ſhort Time, and Crops produced from ſuch Dungs on clayey Lands will hardly pay the Expence; for it requires a Manure of a very contrary Nature from Clay to make it pay the Farmer.

Improbability of the Particles of Clay being globular.

It is plain from this, that the Particles of Clay cannot (as Mr *Evelyn* aſſerts) conſiſt of ſmall round Globules like Sand, becauſe round Globules in contact with each other touch but in one Point, and therefore leave Interſtices between

between them, which would admit Water to paſs through them; but every Farmer knows that Clay will hold Water like a Bowl-diſh, which it would not do if it conſiſted of ſmall round Globules like Sand; neither could ſuch round Globules form ſo cloſe an Adheſion of Parts as we find in Clay.

Fire fits Clay for Vegetation.

When Clay undergoes the Operation of the Fire it relaxes all its Pores, and by bringing the Salts into leſs Compaſs gives it a ſtrong Effervеſcence when it meets with a proper Menſtruum, and more eaſily promotes the Fermentation neceſſary to Vegetation.

The Effect Fire has on Salts.

We find that Egg-ſhells or Oyſter-ſhells calcined, have a greater Fermentation with Oil of Sulphur or Vitriol than when uncalcined; becauſe the ſeveral Principles of which the Shells conſiſt being relaxed, and the greater Part of the Sulphur driven away by the Fire, the remaining Salt lies now more open and naked to the Attack of the Menſtruum,

ſo

ſo ſoon as ever they are mixed together.

The ſame Reaſon holds good in Clay, Limeſtone and Chalk; becauſe the Salts they contain endure the Fire, and come purer out of it as being freed of their Humidity.

Salt what?

The Chymiſts deſcribe Salt to be a ſimple acid Subſtance which enters the Compoſition of all Bodies, and hold it one of the five Principles or Elements thereof.

How much it is the Intereſt of the landed Gentlemen to encourage burning of Clay.

Since it now appears that Salts are the Principles of Vegetation, and Clay produces them in ſuch plenty, I hope, the landed Gentlemen will promote the burning of it; by which the wet clayey Grounds that are not worth owning now, may, in time, preſent them with the following beautiful Landſkip.

Ver

Ver ubi longum, tepidaſque præbet
Jupiter brumas, & amicus Aulon
Fertili Baccho minimùm Falernis
Invidet uvis.

HOR. Lib. II. Car. 6.

CHAP.

CHAP. VII.

The Method of burning barren Lands in North-Britain.

Sæpe etiam ſteriles incendere profuit agros,
Atque levem ſtipulam crepitantibus urere flammis. VIRG. Geor. Lib. 1.

The Nature of moſt of the barren Land in the North.

MOST of the barren Lands in the North are either of a wet or dry Nature; the firſt is generally covered with long Heath, and the laſt with Bent which is a Species of Ruſhes ſhaped like the Blade of a ſmall Sword without any viſible Pith in it. Under the Heath lies a black dry Mould for one Foot deep, (like what are called Heaths in the South of *England*) and under it a black ſtony Gravel; under the Bent or Ruſhes the Soil is of a dark hazel Colour, (like what they call the Moors or the Meers in the the North of *England*) for five Foot deep and then ſtony.

The

The manner they improve theſe Lands is thus,—the Summer before the Ground is plough'd up they ſet Fire to the Heath, and burn it down to the Surface of the Ground; the next Spring they plough up the Land in large Furrows with Oxen, and the Middle of Summer they gather ſome of the Turf into Heaps, about two Barrowfuls in each Heap, on the Tops of the Ridges, the Diſtance of a Pole between the Heaps, which they ſet Fire to. Theſe Heaps light the other Turf that is not gathered in Heaps, which continues burning all the reſt of the Summer with very little Help; and if the Weather proves dry it will keep burning great part of the Winter.

The Method of preparing their barren Lands.

Next Spring they plough it up and generally ſow it with Oats, which grow very rank, notwithſtanding they feed them or cut them twice to hinder it. Theſe Oats are uſed for Seed-corn to other Lands. The ſecond Year they ſow it with Beans or Barley, and the Third

The Sorts of Grain that are generally ſowed on the barren Lands in the North for the firſt three Years.

Third with Peaſe, when they lay it down without any Graſs Seeds for Paſture or Meadow that turns to exceeding good account; for that Ground, like moſt other Aſhes, produces the ſmall white wild Clover in great plenty; * inſtead of Brakes, Heath, *&c.* which it bore before.

The Method of burning Boggs.

After the ſame Manner they burn their boggy Lands, or Moors, when they are drained; ſee the Method of draining them in Chap. IV.

This Method of burning Land differs much from what is called *Devonſhering* here, which rarely produces more than three

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* The Induſtry of the Farmer, when apply'd with Judgment, is eaſily diſcerned by the Product of the Land; and what one of the Father's ſaid of Mankind in general, 'That their Deſerts were often legible in the Recompences conferred, or Puniſhments inflicted on them, 'τὸ κολάσεως ὁ τρόπος τὸ ἁμαρτίας ἢ τρόπον μιμεῖται,'' may juſtly be apply'd to the Improvement or Neglect of Agriculture; than which nothing is ſooner diſcerned.

three Crops; and will never make good Paſture or Meadow after, unleſs there be twice the Value of the Land laid out in freſh Manure. The Reaſon of which I take to be this—The Ground they generally denſher is cold, wet, ſowre Clay, over-run with Ruſhes and Weeds, and ſeldom has a Coat of Mould or Loam above an Inch thick; half of which is ploughed up with the Denſher Plough (ſee the Figure of it in Plate V. b.) and burnt to ſerve as a Manure for the Clay, which laſts not above two or three Years at moſt. In this time all the Salts of the Aſhes are exhauſted, and they themſelves buried ſo low under the Clay that they cannot produce that Fermentation in the Ground which is requiſite for Vegetation; and as the Farmers term it the very Heart of the Ground is quite wore out.

The Method of Devonſhering Land here, with its pernicious Conſequences.

The Nature of the Soil is not the only Thing to be regarded, but its Depth and what Soil is underneath it;—for Inſtance, the beſt Soil if it be not above one Foot deep

The Depth of the Soil to be regarded as well as the Quality of it.

deep and has under it a ſtiff Clay, is not near ſo fertile as a leaner Soil of greater Depth, that lies on a warm Limeſtone, Sand, or Gravel, through which the ſuperfluous Water may deſcend, and not ſtagnate on the Clay to chill the tender Roots of the Plants.

Reaſon why clayey Land does not produce ſo good Crops as other Grounds.

Where there is too much Water (which is generally the Caſe of all clayey Grounds) it hurries the terreſtrial Matter through the Veſſels of the Plant ſo faſt that it has not time to lay hold of it;—for Water is not the Matter that compoſes vegetable Bodies; it is only the Agent that conveys the Matter to them, and diſtributes it to their ſeveral Parts for Nouriſhment.

The Property of Matter.

Indeed Matter, of itſelf, is altogether ſluggiſh and inactive, * and would eternally remain ſo did not Water, Air, or

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* Quatuor æternus genitalia corpora mundus
Continet. Ex illis duo ſunt oneroſa, ſuoque
Pondere in inferius, tellus atque unda, feruntur:
Et totidem gravitate carent: nulloque premente
Alta petunt, aër, atque aëre purior ignis. Ovid.

or Fire fetch it forth, and ſend it up to the Plants for Nouriſhment.

Dr *Boerhaave*'s and Sir *Iſaac Newton*'s Opinions of the Cauſe of Fluidity.

The great Dr *Boerhaave* inſiſted ſtrongly that Fire was the firſt Mover and Cauſe of Fluidity in other Bodies as Air, Water, *&c.* without it he thought the Atmoſphere itſelf would fix into one ſolid Maſs; but our greater Sir *Iſaac Newton* ſet aſide this Theory of Fluidity, and ſubſtituted a new one, *viz. The great Principle of Attraction.*

The Method of burning barren Land in *North-Britain*, the ſame that was uſed in *Italy* in *Virgil*'s time.

I cannot leave this Chapter without taking a particular Notice of the great Genius at the Head of it, to whom I imagine the *North-Britons* are indebted for their Method of burning of barren Land; the Paſſage is this, (1.) 'That 'he often found the burning of bar-'ren Lands of great Service, and alſo 'the burning of the Rubbiſh or Weeds

(1) Sæpe etiam ſterilis incendere profuit agros,
Atque levem Stipulam crepitantibus urere flammis:

'that grow on ſuch Grounds.' Then, after his inimitable Beauty, he deſcribes the Effect that burning has on barren Lands (2), Which he ſays cures all the Diſeaſes that ſuch Grounds are ſubject to. *Berſman*, who copied *Virgil*, ſays 'that the Diſeaſes of Land generally proceed from four Cauſes; *viz.* Leanneſs from want of Aliment, Slimineſs from Exceſs of Moiſture, Cloſeneſs which keeps the Seed pent up, and Laxity which gives too eaſy an Admiſſion to Heat and Cold.' *Virgil* makes burning cure all theſe, for he ſays, 'it removes the Leanneſs, conſumes the Slimineſs, opens the Cloſeneſs, and ſhuts up the Laxity.'

Virgil's Opinion of the Effects that burning Land had on its common Diſeaſes.

Moſt

(2) Sive inde occultas vires, & pabula terræ
Pinguia concipiunt; ſive illis omne per ignem
Excoquitur vitium atque exſudat inutilis humor:
Seu pluris calor ille vias & cæca relaxat
Spiramenta, novas veniat qua ſuccus in herbas:
Seu durat magis, & venas adſtringit hiantis.
VIRG. Geor. Lib. 1.

Moſt if not all the Tranſlators and Commentators on *Virgil* are againſt me, and ſuppoſe that *Virgil* meant only the burning a little Stubble on the Ground (3.); but I am inclin'd rather to think, that the Improvement *Virgil* deſigned for barren Lands in this Place, was burning both the Land (4.) and the Stubble (3.), as appears by the Benefit he ſuggeſts, in the Verſes already quoted (2.), accruing to the Land; for they plainly ſhew that *Virgil* intended burning the Land; his Reaſoning there, and the Advantages he imagines, not being in the leaſt to be accounted for by the burning a little Stubble. They all or moſt of them render it (3.) light Stubble, which I would tranſlate light Heath, Furs, Ruſh, Bent, Brakes or Weeds, in order to make *Virgil* ſpeak like a Man of Senſe and a Farmer.—How can light Stubble be pro-

The different Readings of *Virgil*, in regard to his Method of burning barren Land.

(3.) Levem ſtipulam.
(4) Profuit incendere ſterilis agros.
(3) Atque urere levem ſtipulam:

duced from barren Lands (4.)? Which is contrary to *Virgil*'s Meaning in all his Georgics; neither can it with any Reaſon be ſuppoſed that barren Lands produce any Stubble, at leaſt not ſo much as that the burning of it could be of any Service to ſuch Land; nor could the Land itſelf be burnt by burning the Stubble, or indeed by any other Method after having been ſo lately ploughed, becauſe by breaking into ſmall Pieces it would put out any Fire that could be contriv'd for the burning it.

The Senſe of a Farmer to the Paſſage in *Virgil* relating to the burning of Land.

I once told a Farmer that the beſt way to improve his barren Land was to 'burn the Stubble that grew on it.' Yes, ſaid he, I believe it would, if you can catch any Stubble on it. But, Meaſter, adds he, I'll tell you a Thing more wonderful than that, of a Yew-tree in our Church-Yard, that bows its Head when ever it hears the Clerk ſay *Amen*. This Repartee from the Farmer made me examine

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[(4.) Sterilis agros.

examine a little more in what Senſe VIRGIL and COLUMELLA apply the Word *barren* to Land; which I find is rarely or never done by either of them to Land that has been ſowed, eſpecially when they are inſtructing the Farmer *. I likewiſe find, that VIRGIL uſes the

---

* Thus VIRGIL ſays,

——— Pater ipſe colendi
Haud facilem eſſe viam voluit, primuſque per artem
Movit *agros*, curis acuens mortalia corda.

VIRG. *Georg. Lib.* 1.

Tum ſterilis exurere Sirius *agros*. VIRG. *Æn. L.* 3.

And COLUMELLA uſes *agrum* novare, to make or break up Land.

When they ſpeak of ploughed or Corn Lands, or Paſture or Meadow, they generally uſe *arvum* or *arvus*, in all their Directions about Huſbandry.

Dîque Deæque omnes ſtudium quibus *arva* tueri,
Quique novas alitis non ullo ſemine fruges.

VIRG. *Georg. Lib.* 1.

Exercetque frequens tellurem atque imperat *arvis*. ibid.
Quid dicam, jacto qui ſemine cominus *arva*
Inſequitur, cumuloſque ruit male pinguis arenæ? *ibid.*
Sic quoque mutatis requieſcunt fætibus *arva*. ibid.
Sæpe ego cum flavis meſſorem induceret *arvis*
Agricola, *&c. ibid.*

COLU-

Word which they tranſlate *Stubble* *, frequently to ſignify the whole Stalk either of Corn or Graſs before they are cut, which exactly correſponds to my Reading; and the *crackling Flames* which they apply to *Stubble* is a better Epithet

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COLUMELLA *in ſpeaking of Corn Lands ſays,* Pabulo pecoris magis quam *arva* ſtudent. *When* VIRGIL *is not immediately writing to Farmers, he uſes* Ager *and* Arvum *indifferently through all the* Æniad, *as beſt ſuits the Meaſure of his Verſe.*

Incidit, aut rapidus montano flumine torrens
Sternit *agros*; ſternit ſata læta boumque labores.
VIRG. *Æn. Lib.* 2.

Quiſque ſuos patimur Manis: exinde per amplum
Mittimur Elyſium, & pauci læta *arva* tenemus.
VIRG. *Æn. Lib.* 6.

* *The following Quotations ſhew that* VIRGIL *never confined the Word* ſtipula, *to ſignify nothing elſe but* Stubble.

Nocte leves melius *ſtipulæ*, nocte arida prata
Tondentur. VIRG. *Geor. Lib.* 1.
Spicea jam campis cum meſſis inhorruit, & cum
Frumenta in viridi *ſtipula* lactentia turgent. *ibid.*

In ITALY Heath *is called* ſterpato *to this Day, which ſome Gentlemen more ſkill'd in Etymology than I, may derive from* ſtipula; *and then I have nothing to aſk.*

Epithet for *Heath*, *Broom*, *Brakes*, &c. becauſe they make twice the *crackling* that *Stubble* does.

I am apt to believe that ſome of our learned Tranſlators (eſpecially Mr DRYDEN) would have rendered VIRGIL of general Uſe to the Farmer had they been a little more converſant in Huſbandry; which would have convinced them, that VIRGIL was equally to be admir'd for his great Judgment in Huſbandry as the exquiſite Harmony of his Numbers.

Moſt of our Tranſlators have loſt the moſt uſeful Part of *Virgil*, by their Ignorance in Huſbandry.

But to return to Denſhering—Moſt Farmers who denſher now generally put it off to the laſt three Years of their Leaſes, in which they act very wiſely in reſpect of themſelves, becauſe they can make nothing of it after three Crops, ſo that its lies quite neglected ever after (making good the * *Spaniſh* Proverb of throwing the Rope after the Bucket,

Land that is denſhered after the preſent Method can never be recovered.

* Yra la ſoga con el calderon.

or, as we expreſs it, the Helve after the Hatchet) to the great Loſs of the Landlord; who never can let it for near the former Rent.

A New Method of denſhering propoſed.

If Farmers are under a Neceſſity of denſhering for want of Dung, I would adviſe them to come nearer the Method of burning barren Lands in *North-Britain*; and plough up the Turf they deſign to burn at leaſt two or three Inches thick, which will only require a little longer Time to dry, and a ſmall * Trouble more to burn, for which it will pay ſeven Fold.

The different Quantities of Aſhes that will be to an Acre by the new Method of Denſhering.

By burning the Ground two Inches thick, there will be two hundred and ſixty Load of Aſhes to an Acre; and by burning it three Inches deep there will be four hundred Load to an Acre; which

* La Diligencia es Madre de la buena ventura, y en muchas, y graves Coſas ha moſtrado la Experiencia, que la ſolicitud del negociante trae a buen fin el pleyto dudoſo. CERVANTES, Cap. XLVI.

which may be burnt in a Clamp if the Ground be ſtiff, (ſee Chap. VI.) if not it will be better to burn it in Heaps as in Chap V.

CHAP.

CHAP. VIII.

The Method of planting Willows, Alders, French Oziers, Dutch Limes, and Quince-Trees in moiſt or boggy Grounds that are full of Springs.

" *Fluminibus ſalices, craſſiſque paludibus alni*
" *Naſcuntur.*" VIRG. Georg. lib. 2.

THERE are hardly any Trees that require leſs Labour to raiſe them or pay better than theſe few I have mentioned, when planted in a proper Soil.

The quick Growth of Willows.

I ſaw lately a ſmall Plantation of Willows (about two thirds of an Acre) in my Lord *Fairfax*'s Park at *Leed's-Caſtle* in *Kent*, from which his Lordſhip had cut four thouſand Hop-poles, the fourth Year after they were planted; and would have had many more had not the Deer done them conſiderable Damage.

I once

I once told the above Story to a Phyſician, who had ſpent ſome time in *Ireland*, where he ſaid, he knew a Farmer that had a large Farm, very much overrun with Boggs, from which he could hardly get a Competency for his Family (having nine Children) till one Day he fix'd his Eyes on a beautiful Alder that grew out of one of his Boggs, from which he took the Hint of Planting ſeveral Acres with the ſame ſort of Wood; this ſucceeded ſo well, that he left his Children a ſmall Living after he died.

A remarkable Story of an Alder in *Ireland.*

The Method of Planting the red Willow (which is the beſt for Hoops and Hop-poles) is thus; in the Beginning of *March* get ſome Cuttings from the ſtrongeſt Shoots of two Years Growth, and cut them into Lengths about three Foot long, which plant two Foot deep on the Sides of the Ditches, Ponds, or Boggs, with their Heads a little leaning, and ten Foot diſtant from each other. The Ground End (or that next the old Wood) of the Shoot

Method of planting Willows for Hoops or Hop-poles.

Shoot is ſureſt of growing; and therefore where a great Number of Plants are not wanted, and ſuch Plants are to be had, they ſhould plant the Ground-Ends only.

Proper Soil for *Dutch* Lime-Trees.

The ſame Method may be obſerved in planting the Alder and white or *Dutch* Lime-Tree, but the laſt is not ſo profitable unleſs in Grounds ſometimes overflowed with Salt-water, where the Willow will not grow ſo well.

Manner of planting Willows deſigned for Trees.

Such Willows as are deſigned for large Trees, ſhould be planted from ſtrong Shoots eight Foot long, and ſharpned at the End like a Stake.—Before they are planted there ſhould be Holes pitched in the Side of the Banks or Gounds where they are to be ſet, to prevent the tearing of the Bark by driving them into the Ground.

Method of planting Boggs that are overflow'd.

If there are any wet or boggy Grounds occaſioned by Springs, they may be planted in the ſame Manner only remember

member to let a Foot of the Cuttings be always above the Surface of the Water, and plant them at leaſt three Foot in the Ground, otherwiſe the Water will be apt to ſhake them when the Wind blows ſtrong.

The ſmall Cuttings are generally planted in Rows at ten Foot diſtance, in the Quincunx Order thus,

The large Cuttings deſigned for Trees ſhould be planted eighteen Foot diſtant from each other.

Beſt way of raiſing the red Willow.

But as the red Willow is not ſo ſure a Grower from Cuttings as the Common Water-

Water-willow, the Method I think the beſt for raiſing a Plantation of them is by planting a Nurſery of Cuttings about the Bigneſs of a Man's Thumb, in ſome moiſt Soil, and after they have ſtood one Year or two at moſt to plant them out where they are to ſtand at ten Foot Diſtance, as before directed.

By this means a Plantation is raiſed at once, without any hazard of the Plants dying, or being choaked up and killed with Weeds, *&c.* as Cuttings are very ſubject to be in ſuch wet kinds of Land; and by this Method Plantations of the red Willow for Woods may be raiſed, and will grow very well on any dry Soil, which is contrary to the Nature of the Water-willow.

Method of planting Oziers.

If this wet Land lies in a Place where Hop-poles or Hoops are not ſo profitable, it may be planted to as great Advantage with the ſmall *French* Ozier for the Uſe of the Baſket-Makers, or with Quince-trees, according as either of them may be the moſt

moſt likely to turn to Account. If with the Ozier they ſhould be planted in the ſame Manner as the Willow-Cuttings before mentioned, and at the Diſtance of five Foot in the Quincunx Order.

Nil Radicis egent aliæ.
VIRG. Geor. lib. 2.

Method of raiſing Quince Trees.

But if planted with Quince-Trees, they muſt be ſet twenty Foot Diſtance on the Square; and as their Succeſs depends on the Method of raiſing them, I ſhall inſert it here.—— The common Way is to raiſe them from Suckers, but as Trees raiſed from Suckers grow but ſmall, and decay much ſooner than thoſe raiſed from the Kernel, I ſhould adviſe planting Quinces raiſed from the Kernel if they can be had.

All fruit Trees are better for grafting.

But whether they are raiſed from the Kernel or from Suckers, they ſhould be grafted about five or ſix Foot high (before they are placed in the Plantation) with the large Pear Quince, which is eſteemed

eſteemed the beſt kind; for Experience has fully proved that all kinds of Fruit Trees after grafting are not only better in the Nature of their Fruit, but much more fruitful than theſe Sorts that have not been grafted.

Pomaque degenerant ſuccos oblita prioris:
Et turpes avibus prædam fert uva racemos.
——— mutatamque inſita mala
Ferre pyrum, & primis lapidoſa rubeſcere corna. VIRG. Georg. 2.

Method of planting Quince-trees.

In planting the Quince-trees do not cut off the middle Tendon from the Roots, nor ſhorten it, but make a Hole for it with a Pitcher, at leaſt three Foot deep, for they love to run deep in the Ground with their Roots.

CHAP.

CHAP. IX.

Directions for making Fiſh-Ponds.

IN the draining of Land, Ponds are often requiſite; for which the following eaſy Rules concerning them will not be foreign to this Treatiſe.

The beſt Grounds for Fiſh-ponds are thoſe that are full of Springs; but when they cannot be had, the Pond ſhould be made ſo as to have a little Brook run through it, or at leaſt to receive the Water which falls from the Hills round about it.

The beſt Grounds for Fiſh-ponds.

In making of Ponds the Head ſhould be at the loweſt Part of the Ground, and the Trench of the Floodgate ſhould have a good ſwift Fall to facilitate the draining of the Pond when neceſſary; which will prevent the Fiſh from ſickening amongſt the ſtagnated dirty Water.

The great Convenience attending a ſwift Fall to the Trench of the Floodgate.

Proper Depth for a Pond.

The Pond ſhould carry ſix or ſeven Foot Water, and ought to be nine Foot deep to receive the Rain and Freſhes which fall into it; otherwiſe the Fiſh will be ſure to go off with the firſt Flood that overflows the Pond.

The beſt Make of a Pond.

It is very neceſſary to have Shoals on the Sides of the Pond for the Fiſh to lay their Spawn on, and ſun themſelves of which they are very fond; beſides it exceedingly promotes their Growth in a feeding Pond. There ſhould alſo be part of the Banks hollow here and there to ſhelter them from the Weather, and Roots of old Trees that are hollow to prevent the Poachers, and Iſlands to ſerve as retiring Places for them.

What Ponds are beſt for fattening the Fiſh.

The beſt Ponds for feeding are thoſe that receive the Stale and Dung of the Cattle, and as they commonly lie pretty near the Houſe they ſhould be ſtocked with the beſt

beſt and largeſt Fiſh, becauſe they are in no Danger of being ſtole.

If the Pond be a Breeder the Fiſh will never grow large; therefore turn it into a feeding Pond, if wanted, by this Method;—— try what Quantity of Fiſh it will contain and put in all Milters, or all Spawners, which in a little time will grow exceeding fat. The way to know the Milters from the Spawners is thus, preſs them gently with your Thumb on the Belly near their Navel, and the Spawners will ſhew their Roes, and the Milters a little watry Blood. Way to know the Spawners from Milters.

There ſhould be ſome great Waters for the Head Quarters of the Fiſh where they can be had, as alſo Stews to convey any Part of the ſtock from one to the other.

A Pond of an Acre of Water will feed ſixty Brace of Carp or Tench well; for the general Method is to overſtock all Ponds, by which Gentlemen that have a thouſand Brace of Fiſh in their Ponds can hardly kill one Brace in a Year, Quantity of Fiſh that an Acre of Water will feed.

that is really fit to come to Table; whereas if they would ſtock their Ponds according to the above Directions, they would never want fine Fiſh and great Plenty.

Beſt time for deſtroying Weeds in Ponds.

When the Ponds are full of Weeds chuſe the Autumn to clean them in rather than the Spring, becauſe the Seed as well as the Roots may be beſt deſtroyed then; and all Ponds ſhould be drained once in four or five Years at leaſt and the Fiſh ſorted, putting thoſe of a Size and genus together in ſeparate Ponds as above directed.

Froſt a great Enemy to Pond Fiſh.

The greateſt Enemy to Pond Fiſh is the Froſt, eſpecially when the Ponds are over-run with Weeds, the clearing of which will always prevent Miſchief from that quarter; and will alſo prevent the Water from ſtinking in Summer, which often deſtroys the Fiſh, eſpecially the Spawners, who chuſe at that time the ſhalloweſt Waters.

The

The beſt Inſtrument for clearing the Ponds of Weeds is called a Creeper; the Figure of which ſee in Plate VIII. Fig. 1. and is to be uſed thus; get a Rope that will go croſs the Pond and make a ſmall Nooſe to go over the Middle Tine of the Creeper at B, and twiſt the Rope round the Handle till it comes to C, and there tie it with ſome Packthread; then drop it cloſe down by the Bank-ſide, and draw it croſs and croſs with the Rope till all the Weeds are out. In caſe the Weeds are ſmall buſh the Teeth of the Creeper with a Buſh or ſome Sticks, and that will prevent their ſlipping between.

Uſe of the Creeper for clearing of Ponds from Weeds.

Method of uſing the Creeper.

The Fiſh that thrive beſt in a clayey Bottom are Carp, Tench, and Flounders; the laſt of which will grow much larger in a Pond than they are commonly found in a River.

What Fiſh thrive beſt on Clay.

As many Gentlemen of late Years have been robb'd of their Fiſh by a foreign

Receipt to deſtroy the *Baltick* Rats.

Enemy (I mean the *Baltick* Rats) I ſhall give them a Receipt that may be depended on to deſtroy them from their Ponds and Houſes; ſince the common Poiſon given to other Rats will not decoy them, take the following Ingredients and mix them together, and make them up into Pills and and lay them in their Runs.

One Ounce of Oil of Anniſeeds,
Half a Pound of Arſenick,
Two Ounces of Nux Vomica grated,
One Pound of Hogs Lard.

This Poiſon the *Baltick* Rats and others will be ſure to eat, and it will be as ſure to kill.

Method to make a Trail for the Rats to gather them all together.

But in Caſe any of your Neighbours ſhould ſupply you with a freſh Stock, which is often the Caſe, let them perform the Operation the ſame Time with you; which if they refuſe you muſt then lay the above Poiſon mixed with a Quarter of a Pound of *Cocculus Indicus*, or *India* Berries, in the End of ſome Barn or Stable; and

and get one Gill of Oil of Rhodium with which anoint a Piece of Bullocks Lights, and tie a Rope or String round the Lights, and at Night when there is no Noiſe let one of your Men go round and round your Neighbour's Houſe, Ponds, and Barns and trail the Piece of Lights after him all the Way on the Ground till he comes to the Place where the Poiſon lies,— and then lift it off the Ground, and put it out in the Garden or Orchard on a Tree, but not near the Place where the Trail was made, otherwiſe all the Rats will get Scent of it and leave the Poiſon, for which reaſon do not hang it in the Wind of them. In two Hours time your Neighbours Rats and your own will come to their laſt Supper, where they will ſoon get drunk, and in that Condition you will find them all in the Morning.

If you think you have not Gueſts enough, or Victuals enough for your Gueſts, make an other Trail the next Night, and give them the ſame Entertainment.

A Dog or Cat will not eat this Poiſon.

A Dog or Cat will not touch the Poiſon, becauſe of the Oil of Anniſeeds, of which the Rats are extremely fond; however to prevent any Danger that way, try the Dogs and Cats with it, and if they offer to eat it, rub their Noſes with a little of the Aniſeed Oil, and that will prevent their touching it.

The firſt Receipt will kill the Rats equally as well as the laſt, only you will not ſee them deſtroyed as by the laſt; for it is the *India* Berries that makes them drunk, ſo that you may knock them dead before they offer to ſtir.

This Poiſon general to all Vermin.

This Poiſon will have the ſame Effect on Moles, Mice, Stotes, Polecats, and Weaſles, by laying it in their Runs and Haunts, ſo that a Gentleman and Farmer ſhould never be without it.

CHAP.

CHAP. X.

Compoſts or Mixtures for wet, clayey, or loamy Land.

Τῶν μικτῶν ἀλλοιωθέντων ἕνωσις. Ariſt.

ALL Bodies are mixed by Mediation or Contact, and Contact whether of Compounds or Atoms is performed three Ways, 1. When two globular Bodies meet; 2. When two flat or ſquare Bodies meet; 3. When a concave and a convex Body meets. The firſt is called Appoſition; the ſecond Application; and the third Intruſion. Different Ways that Bodies can be mixed.

In making a Compoſt, the Nature of the Soil on which it is to be laid ſhould be the chief Guide, The Soil is always to be the Guide for the Compoſt.

" *Conti-*

" *Continuo has leges, æternaque fœdera*
" *certis*
" *Impoſuit natura locis.*"

VIRG. Georg. Lib. 2.

The ſame Manure often repeated will not have a good effect.

for one Sort of Manure will not do on all Soils if it be never ſo good; neither will the ſame Manure repeated often on the ſame Soil produce Crops equally good. The Reaſon of which may be this: The ſmall Particles that compoſe the Manure having filled up all the Cavities of the Soil on which it was laid, that their different Figures will allow by frequent Repetition, there is no room left for Fermentation without which there can be no Vegetation.

Experiment of Waters diſſolving a greater Quantity of different Salts than it can do of one or two.

The Proof of this is ſeen by an eaſy Experiment, *viz.* Take a Gill of Water and diſſolve in it as much common Salt as it will bear, then pour it off from the Salt that ſubſides, and after this it will diſſolve ſix Drachms of Salt of Nitre,

Nitre, but if there be more Nitre added, it will ſubſide as the common Salt did; then ſeparate the Water from the ſubſiding Nitre, and put two Drachms of of Salt Ammoniac to it, and it will diſſolve that.

This makes it evident that ſuch Particles of the Salts as diſſolve in the Water muſt have a different Figure from each other; for if they had not, there would be no Super-impregnation (which is contrary to Demonſtration) but the Pores of the ſame Water would imbibe as much of one Salt as anſwers to the Weight of all the three Salts.

Reaſon for the above Experiment.

The ſame Reaſon will hold good in all Mixtures of Earths; the Fermentation of which will ceaſe, as the Super-impregnation of the Salts, by too much Repetition of the ſame ſort.

The Mixture of Earths, and Water and Salts, the ſame as to their Effects.

By this every Farmer may learn the Neceſſity of changing his Manure on the ſame Soil; without which

which he never can have good Crops.

The ſame Sort of Corn often repeated on the ſame Soil will wear it out.

Daily Experience ſhews, that ſome Soils which were once proper for the Production of particular Sorts of Vegetables do not continue ſo, but in time loſe their Properties till they are ſupplied with a freſh Stock of Salts from a different Earth; or are laid down for ſome Years, in which time they imbibe the nitrous Particles of the Rain, Dew, and Atmoſphere.

My Lord *Bacon*'s Opinion of Marle and Sea-Sand.

My Lord *Bacon* reckons Marle the richeſt of all Soils, and Sea-Sand the moſt abounding in Salts; but I think Experience has ſhew'd that his Lordſhip was miſtaken in theſe Hypotheſes; for Marle itſelf being full of Salts, makes a good Manure for light ſandy Land, yet where the Soil itſelf is Marle it will not produce ſo good a Crop of any Sort of Grain as a common Earth; —and Sand as ſuch is found to contain little or no Salts, for what Salts it contracts

Experience contrary to my Lord's Opinion.

tracts from the Sea can not with any Propriety be aſcribed to the Soil whether Sand or of any other kind.

The idle Catalogue of Manures preſcribed by moſt modern Authors, on Huſbandry and Gardening.

Moſt of the Writers on Huſbandry and Gardening of this Age, have furniſhed the World with large Catalogues of Compoſts and Dungs, which they extol to the Skies for their wonder-working Qualities, *viz.* The Dungs of Turkies, Geeſe, Hens, Pidgeons, Mules, Aſſes, Deer, Hogs, Sheep, *&c.* and Compoſts of Rags, Paper, Horſes Hoofs, Pairings of Horn, Malt Duſt, Sea Salt, Kennel Dirt, Rape Seed when the Oil has been preſs'd out, Malt Grains, Aſhes of Moſs, *&c. &c. &c.* all which, and a hundred more I could name are very good. But I believe, if the Farmers could not procure Amendment for their Lands much cheaper than moſt of thoſe Sorts they have recommended, there would ſoon be the greateſt Famine in *Great-Britain* that ever was known.

The

A monſtruous Propoſal of a modern Author for the Improvement of Land.

The following is an Eſtimate of one of the cheapeſt Manures that is preſcribed by a modern Author, who has obliged the World with a great Number of ſuch; by which any Farmer may judge of the reſt. " Rye Graſs, " ſays he, ſeldom wants any Aſſiſtance " till after it has been ſown a Year " or two, but when it does, take for " one Acre,

	l.	*s.*	*d.*
30 Load of Shovellings of the Streets —	03	00	00
15 Load of Dung ——	01	10	00
6 Load of Lime —	09	00	00
4 Load of Pidgeons Dung	04	00	00
	17	10	00
To Rent for an Acre of Land ——	00	10	00
	18	00	00

If

	l.	*s.*	*d.*
If the Acre ſhould produce three Load of Hay, and the Charge of Mowing, Making, Tythe and Carriage be deducted, the Profit may be —— ——	04	00	00
The Farmer * then loſes the firſt Year only —	14	00	00

How much is this Part of the World obliged to ſo great a Genius for his important Diſcoveries in Huſbandry! Every Farmer knows that a light looſe Land requires a Compoſt of a heavy

* By this ſtrange Way of improving Land, one would imagine, that our modern Authors had laid the *Spaniſh* Proverb down as a Rule in Huſbandry, that what coſts moſt is of the greateſt Value, but they forget that Don *Quixote* was ſpeaking of Glory in War and Letters, when he ſaid; "*Y es razon averiguada, que aquello, que mas cueſta* "*ſe eſtima y deve de eſtimar in ſe mas.*"

Nature,

Nature, and a heavy Land a light Compoſt; to the laſt of which I confine my ſelf.

Dung that is deſigned for ſtiff Lands ſhould be laid on as rough as poſſible.

If Dung only be laid on ſtiff or wet arable Lands, it ought to be taken from a Barn-yard or a Stable-dunghill rough and not above half rotten when laid on the Land (contrary to the Directions of all modern Authors) by which it will keep the Land twice as long open.

The beſt ſimple Manures for ſtiff clayey Land.

Amongſt unmixt Manures the following are the beſt for ſtiff, clayey, arable Lands, *viz.* Cockle-Shells, Sea-Sand, or Pit-Sand, Coal-Aſhes, Chalk, Brick and Mortar rubbiſh, or the Aſhes of burnt Turf and Clay. All theſe are very good for the enriching and making theſe Sorts of Land more gentle and friable, and may be uſed ſingly or mixt together (as the Farmer can moſt conveniently procure them) and laid from fifty to a hundred Load on an Acre.

Several

Several of them are likewiſe very uſeful to lay on Paſture-Ground, as Chalk from 60 to 80 Load on an Acre, and Sea-Sand or Pit-Sand, the ſame Quantity; which will make the Graſs particularly ſweet and nouriſhing for milch Cattle, and Ewes or Lambs. So likewiſe, dry Sea-Coal Aſhes, Soot or Pidgeons Dung, ſowed thin on Paſture-Grounds or green Corn, in the Winter-Seaſon, are very uſeful on cold and wet Soils,

As to mixt Compoſts the following may be made by moſt Farmers with out any great Expence, *viz.*

A Compoſt of Dung, Mould, burnt Turf, and Sand.

1. Take four Load of Dung from a Barn-Yard, or Horſe-Dung, or both, and ſix Load of Mould from a light or boggy Soil, if to be had, four Load of burnt Turf, and three Load of Sea-Sand, or any ſharp Sand. — This Proportion may be obſerved to any Quantity that is wanted; the beſt time to make it is in *May*, and it ſhould be turned twice be-

tween that and *Michaelmas*; when it may be uſed from fifty to eighty Load on an Acre.

A Compoſt of Sea-Ouze, burnt Turf, or Pond Mud.

2. Take ten Load of rich Sea-Ouze, or Pond-Mud, and ſpread it till it is dry, then break it, and put ten Load of burnt Turf to it.—This Compoſt ſhould be made in *Auguſt*, and kept in a Ridge until the Spring that it is wanted for uſe. Forty Load of this will be ſufficient for an Acre.

A Compoſt of rotten Leaves, burnt Turf, and Sand.

3. Take five Loads of rotten Leaves, five Load of burnt Turf, and five Load of Sand. Mix them in *October*, and turn them twice before Spring when they may be uſed. Fifty Load of this will be ſufficient for an Acre.

A Compoſt of Mole-hills and Stone, or Chalk Lime.

4. When a Farmer has no Convenience to burn Turf or Mole-hills, they may be made into a Mixin thus.—About *Michaelmas* plough the Turf or Mole-hills up, (ſee the Plough for that Purpoſe in Plate V.) and lay it in a Mixin rotting till

till *Midſummer* following, then to every ten Load of Turf or Mole-hills put one Load of Stone or Chalk-Lime (conſiſting of thirty-two Buſhels) and turn and mix them well together, and let it lie till the Winter following, when thirty Load may be laid on an Acre.

A Compoſt of Sheeps Dung and Sand, or Horſe Dung and Sand, being what is generally uſed in *French Flanders* with great Succeſs.

5. When a Farmer has Sheep, and can come at Sand eaſily, there may be great Advantage made from their Dung and Stale, thus; build a Shed for them near the Place where they paſture, and during the Heat of the Summer let them ſtand from eleven o'Clock in the Forenoon to three in the Afternoon penned up under the Shed, where the Ground ſhould be covered with Sand ſix Inches deep every Night, and cleaned out once in eight or ten Days time.—They may alſo be penned up of Nights during the Winter-Seaſon, and littered in the ſame manner. This will make an excellent Manure of it ſelf, or mixed with an equal Quantity of any light Soil. This is the Method they take to

preſerve their Sheeps Dung in *Flanders*, and if the ſame Method was taken in our Stables, it would make a very good Compoſt; beſides in the Summer time it will keep the Stables cool, and hinder the Horſes from breaking their Hoofs by kicking, when they are tormented with the Flies.

The common Manure for ſtiff Lands near the Sea.

6. Near the Sea they uſe Cockle-Shells or any other Sort of Shells and Sea-Weed for wet, clayey, ſtiff Lands, which puts them into a Fermentation, as Balm does Dough, by opening and looſening the Clods, and by that means makes way for the Roots to penetrate into the Clay, and the Moiſture to enter into the Fibres. —Dr *Bury* obſerves, that in *Wales* they manure their ſtiff clayey Lands with a brackiſh Sea-Sand which very much quickens it, ſo that what would otherwiſe be the barreneſt Part of that Country is now the richeſt.

An Experiment made on Clay Aſhes.

Where there is plenty of Clay, and Wood or Peet to burn it, theſe Compoſts

poſts will be of leſs Uſe; for the Clay-Aſhes exceed any thing that can be laid on ſowre, wet, ſtiff Land, eſpecially when the Clay is burnt wet, as may be ſeen by the following Experiment, *viz.* I took twelve Pounds of Clay-Aſhes that had been burnt wet, and put them into an earthen Veſſel after they were pounded, on which I poured about two Quarts of boiling Water more than what covered the Aſhes, and kept the Veſſel near the Fire for ſix Hours, ſtirring the Water and Aſhes ſeveral times; after which I poured the Water off from the Aſhes, and filtrated it through Cap-Paper, when the Salts were left at the Bottom after evaporating the Water. The ſame Experiment I tried on an equal Quantity of Clay-Aſhes that had firſt been dried in the Sun and burnt afterwards, which did contain little more than half the Quantity of Salts that was produced from the Aſhes of the Clay that was burnt wet.

The Aſhes of wet Clay burnt, contain more Salts than the Aſhes of dry Clay burnt.

When Clay-Lands are improved after the above Method they may be planted with Pears.

After theſe Sorts of wet clayey Soils are well improved by any of the Methods before preſcribed, and are become about one Foot deep of Earth above the Clay; if ſuch Lands lie in any County where Fruit turns to account, they may be planted with Pear-Trees, at the Diſtance of thirty Foot on the Square, which will anſwer very well, if not planted with improper kinds.

The Sorts of Pears proper for Clay-Lands.

The Sorts proper for ſuch Lands are the Burgamotts, Cuiſe Madams, and Popperins, which are very good Bearers; but the very late Winter-Pears are not ſo proper to theſe Soils;—for although Corn is earlieſt ripe on clayey Soils, Fruit is lateſt, which will always hinder the Winter Sorts from being very good.

In a proper Climate, clayey Lands when well improved, may be planted with Hops to advantage.

When theſe clayey Lands are ſo far improved as to be fit for Pears, they may in a proper Climate do very well to plant Hops on, notwithſtanding what has been ſaid by ſome Writers to the contrary.

By

By a proper Climate, I mean the moſt ſouthern Counties of *South-Britain*, or at leaſt not above one Degree of North Latitude from *London*. If this Sort of Land is planted with Hops, the large white *Farnham* Hop, or what in *Kent* is called the Golden Hop, is the moſt proper, being early kinds that agree well with theſe Sorts of Lands.

The Hops moſt proper to plant on clayey Land.

If the Land lies on a Declivity it will do beſt, on Account of carrying off the Water occaſioned by the great Rains in Winter; for which purpoſe Furrows ſhould be ploughed or dug every other Row of Hills one Foot wide only, and as deep as to the Clay. The Furrows ſhould be made about *Michaelmas* (which if dug will coſt five Shillings *per* Acre) and will keep the Ground ſufficiently dry all the Winter; after which it ſhould not be dug till *February*.

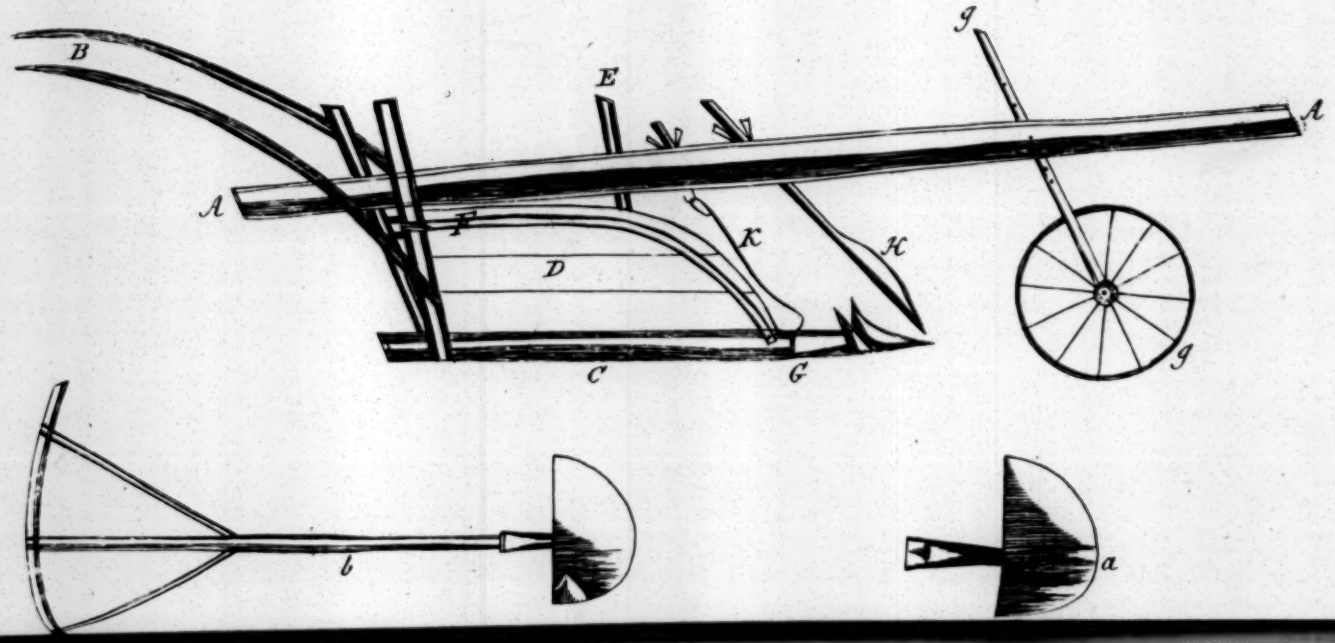
The Method of digging Water Furrows in Land that is planted with Hops.

With this Sort of Management theſe kind of Soils will anſwer very well for Hops; and are leſs ſubject to Injuries

ries from Honey-Dews than other Soils, eſpecially if the Planter makes uſe of the light Sorts of Manure before-mentioned.

CHAP.

Plate V. The Figure of a Plough for making Water Furrows, and a Densher Plough. facing Chap. XI. p. 89.



CHAP. XI.

The Uſe of ſome Ploughs and other Inſtruments in Huſbandry, exexhibited in Plates IV, V, *and* VI, *not deſcribed by any former Author.*

Primus aratra manu ſolerti fecit Oſiris,
Et teneram ferro ſollicitavit humum.
TIBULLUS.
Prima Ceres ferro mortalis vertere terram
Inſtituit. VIRG. Geor. Lib. I.

THERE is hardly any Inſtrument uſed in Huſbandry of ſo great Uſe as a Plough, of which there are different ſorts almoſt in every County.—But as I have not ſeen the Figures of the two following in any Author within my Knowledge; I hope it will not be unacceptable to the Farmers to delineate them here.

The

Deſcription of the Plough for making of Water-furrows.

The Plough exhibited in Plate V, is for making of Water-Furrows either in arable or meadow Land, by the Uſe of which the Expence of multiplying Ditches may be ſaved. A. A. is the Plough Beam, B. the Handle or Stilts, C. the Neck or Shear-beam, D. the Earth-boards, E. the Sheath, F. the falſe Earth-board that may be taken off when the Plough is wanted for other work, G. the Shear-iron or Plough-ſhare, H. the Coulter, I. I. the Wheel which may be taken up or let down at pleaſure to ſerve as a Reſt.—— K. the falſe Coulter.

The Method of managing the Plough in ploughing up Water-furrows.

The Method of working this Plough is as follows, put four Horſes lengthways to it, and place the Coulter within an Inch and half of the Point of the Plough-ſhear, and let the reſting Wheel down as low as the Depth of the Water-furrow requires below the Surface of the Ground; then enter the Plough in the Middle of the Furrow which keep ſo all along.—

The

The Plough will tear up a Foot of the Turf in breadth, and will lay it on each Side the Furrow as the Coulter divides it, ſo that there will be no Occaſion of coming up the Furrow again, or cutting one ſide of the Turf with a Spade, which muſt be done after any other Plough but this; for the two Fins or Wings of the Plough-ſhare cut the Turf equally on both ſides the Furrow.

This Plough will ſerve for any other uſe, by taking off the Share and falſe Earth-boards and uſing a common Share. It will alſo ſerve to plow up Mole-hills by changing the Share for that marked *a.* which is performed in the Manner following. Take two Yoak of Oxen that are very gentle, or for want of them four gentle Horſes, and ſet the Reſt-wheel I. I. ſo as to keep the Share exactly level with the Ground, then lead the Oxen or Horſes over the Mole-hills and the Share will cut them even with the Turf, and the Coulter will divide them to facilitate the loading of them.— When the

The ſame Plough will ſerve for Mole-hills by the changing of the Plough-ſhare and falſe Side-boards.

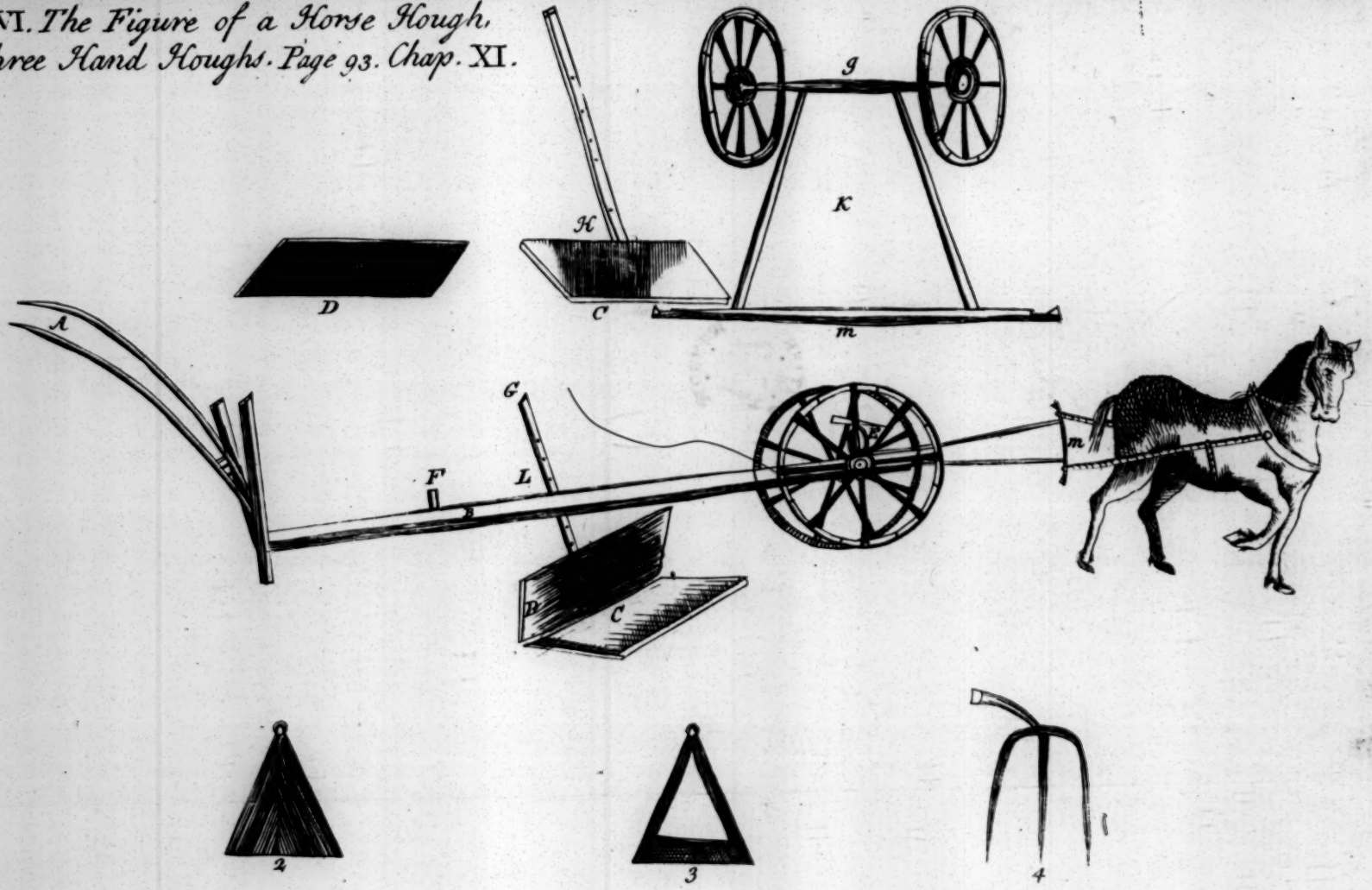
the Field hangs, there muſt be an Allowance made with the Reſt-wheel for its Declivity, which muſt be lowered in Proportion when coming down Hill, and raiſed proportionably going up Hill; otherwiſe the Share will run too deep into the Ground for the Cattle to draw it.

Method of quartering of Mole-hills when the Field is not very full of them.

This Plough is only to be uſed for Mole-hills when the Fields are very full of them; but where the Fields are not very full, the beſt Way is to quarter the Mole-hills about *Michaelmas*, with the ſort of Spade deſcribed in Plate V, Figure b. and turn back the Quarters, and throw out the Heart or Core of the Hills a little lower than the Surface of the Ground; then ſpread what is thrown out on the Ground, except the Turfs of the Hills, which keep till the Beginning of *March*, and then turn them into their Places again. By this Means the Ants will be deſtroyed, for the Hills being cut lower than the Surface of the Ground, the Rain will ſettle on their Bottoms and drown the Ants.

The

Plate VI. *The Figure of a Horse Hough, and three Hand Houghs. Page* 93. *Chap.* XI.



The following Plough may be of great Service to hough Beans and Peas that are ſet in Rows, or Hop-Gardens, ſee Plate VI. A. is the Stilts of the Plough, B. the Beam, C. the Hough to cut the Weeds which lies flat on the Ground, and is twelve Inches long and ſix Inches wide, ſee C. the ſeparate Hough without the Plate of Iron faſtened to the Handle of it at H; at L. are Holes in the Handle of the Hough to let it up and down at pleaſure, D. the Plate of Iron above the Hough, the ſame Width and Length as the Hough, turned a little back on each ſide the Iron Handle G, to which it is faſtened at H, with an iron Pin that goes through the Handle G, to take off and on at Pleaſure; for there is no Occaſion for the Back-plate D. when the Ground is a houghing, becauſe the Uſe of it is only to turn the Mould up to the Rows; ſo that it muſt not be uſed till the Ground has been houghed ſome time and the Weeds killed

Deſcription of the Share-brake, or Plough-brake for houghing of Beans or other Corn ſowed in Rows.

killed; otherwiſe it would turn all the Weeds up to the Rows of the Beans, *&c.* before they were killed, and by that Means do more Miſchief than the Hough would do good. E, a round Piece of Wood that keeps the Shafts K on the iron Pin that goes through the Hole of the Shafts at I, and faſtened down with an iron Key to keep them from ſlipping off. F, another Hole in the Beam to place the Handle of the Hough in when it is found better than the Hole at L. K the Shafts to put the Traces of the Horſe to at *m*.

Deſcription of the Inſtrument called a Creeper.

The Inſtrument exhibited in Plate VIII. Figure 1, is called in *North-Britain* a Creeper, and is uſed for dragging Weeds out of Ponds and Ditches in the Manner following, *viz.* Fix a Handle ten Foot long in the Socket at *a*, and faſten a Rope (that is long enough to reach croſs the Pond) with a Nooſe at the End of it round that Tooth marked B, and twiſt the Rope round the Handle till it comes

The Method of clearing Ponds with a Creeper.

to

to C, and tie it there with a Piece of Pack-thread.—When the Rope is thus faſtened carry the End of it acroſs the Pond, and let the Creeper fall in the Water with its Teeth downwards, and drag it after the Rope; then clear its Teeth of the Weeds, and drag it back again, till all the Weeds are got out of the Pond.

If the Pond is very full of ſmall Weeds put a little Piece of black Thorn Buſh between the Teeth of the Creeper, and it will bring out a Load at a Pull.

The Method of uſing the Creeper in Ditches.

When the Creeper is uſed for cleaning of Ditches there is no occaſion for a Rope to the Handle for a Man may then work it with great eaſe; only, if the Weeds be ſmall, buſh it a little.

The Uſe of the *Dutch* Hough.

The Inſtruments in Plate VI. marked Figure 2, 3, and 4, are three Houghs which are very uſeful on different Occaſions. That mark'd Figure 2, is beſt to uſe when the Ground is moiſt and wet, and

and there is a Neceſſity to deſtroy the Weeds, for it will make great Riddance; afterwards when the Ground grows dry the Weeds ſhould be raked in Heaps to kill them.

The Uſe of the open Hough.

That marked Figure 3, is good to hough the Ground when it is dry and brittle; and then all the Weeds will lie on the Surface of the Ground, and there will be no Neceſſity of raking it afterwards, becauſe at the ſame time that it looſens the Ground the Weeds ſlip thro' the Hough ſo that none of them are buried.

The Uſe of the Sprong Hough.

Figure 4, is a Hough that is of great Service when the Ground is very hard, dry, and much bound; for this Inſtrument will tear it up, and break it when the other Houghs can be of no Uſe.

The Uſe of the Hough-harrow and the Manner of working it.

The Inſtrument marked Letter A. Plate VIII, is called a Hough-harrow and is of great Service in light Grounds, when they are full of Couch Graſs or other

other noxious Weeds. The Manner of uſing it is thus, put one Horſe or two to it, and faſten a Handle to it at A, for a Man to guide it by and keep it down in the Ground; by this Means it will hardly be poſſible for it to miſs of any of the Weeds.

The Uſe of the Hough-harrow on Summer Fallows.

It may alſo be uſed with good Succeſs on Summer Fallows inſtead of a Plough for Turnips; only mind to clear the Harrow from Weeds every time it comes to the End of the Land.

The Method of planting and houghing of Beans.

When Beans are planted in Rows they generally allow eleven Rows to one Rod; and hough them firſt when they are four Inches high, and a ſecond time a little before they bloſſom, and the third time they hough and Earth them when they are in Bloſſom.

CHAP. XII.

The Method of ordering wet, ſtiff, or clayey Lands for Gardens, and of raiſing and cultivating Fruit-Trees, both in wet or dry Soils.

Quare agite, ô proprios generatim diſcite cultus,
Agricolæ, fructuſque feros mollite colendo.
VIRG. Geor. Lib. II.

The following Diſcoveries in Huſbandry are the Practice of a Gentleman in *Kent*, and differ much from the common.

THE World is indebted to a Gentleman in *Kent* for the following uſeful Diſcoveries in Gardening, of which he has had thirty Years Experience; and by his great Knowledge of Nature has had the beſt Fruit in that County for many Years. By comparing his Method with the common Practice of our Nurſerymen, Gardeners, and modern Authors, you will hardly be able to determine whether

whether the Ignorance of the one, or Aſſurance of the other is moſt to be wondered at.

If a Houſe is ſituated where Clay, Marle, or other wet and ſtiff Soil lies near the Surface, it requires a particular Management (much different from the common) to make Gardens equally profitable with thoſe on a drier and more gentle Soil. However the following Directions if properly followed will, with little Expence, remedy the Inconveniencies to which wet and ſtiff Soils are liable in Garden-Grounds.

Directions for laying out a Garden on a ſtiff clay Soil.

In the firſt laying out of ſuch Gardens, the Ground to be choſe for that purpoſe ſhould either lie, or be raiſed a little above the Level of the adjoining Land; for the Convenience of carrying off the ſuperfluous Water after great Rains or Snows.

A Canal or Pond uſeful to carry off the Water.

But if it does not lie higher than the neighbouring Ground, nor can without

too great an Expence be raiſed above it, a Pond or Canal may be dug (ſee Chap. IX.) in the contiguous Field, to receive the Water that comes from the Garden-Ground; which Pond will not only be uſeful for watering the Garden in Summer, (Pond-Water being much the propereſt for that Purpoſe) but if it be of ſufficient Dimenſion may be ſtored with divers Sorts of Fiſh; ſee the proper Sorts in Chap. IX.

Method of managing the Turf and Clay after it is dug.

The Turf and Clay dug out of the Canal or Pond may be burnt in a Clamp as before directed in Chap. VI, which will be of great Uſe in manuring the Garden or other Grounds, and pay very well for the Expence of digging.

Directions for laying the Ground out in general, and Gravel Walks in particular.

In the laying out of Pleaſure-Grounds (which are now generally made with Graſs and Gravel) Care ſhould be taken to make them a little on a hanging Level for carrying off the Water; and the Gravel-Walks ſhould be laid ſomething thicker of Gravel, and rounder than uſual,

uſual, by which means they will be always dry and fit for uſe.

The Method of making up the Borders for Wall-Fruit, with the bad Conſequences attending the preſent Method preſcribed by modern Gardeners.

The Borders for planting Wall-Fruit on a ſtiff clayey Soil ſhould be made at leaſt five Feet wide, one Foot and a half above the Clay, and twelve Inches high above the Level of the Ground. This may be done with any good and light Sort of Mould, not by digging and trenching into the Clay, which is the common Method, becauſe that would cauſe the Water to draw towards the Wall, and ſtand in a Pond under the Trees which would very much injure them; but it muſt be done by digging down no lower than till you come to the Clay, making your Border five Foot wide and two Foot deep from the Top of the Border to the Clay, which after ſettling will be little if any thing above eighteen Inches deep.

Fruits fit for Borders.

When Borders are thus prepared, Apricots, Peaches, Nectarins, Grapes, Plumbs and Pears, may be planted

with good Succeſs, notwithſtanding a Folio Modern * Author aſſerts the con-

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* The Author of the *Gardeners Dictionary*, under the Word *Garden*, ſays, " It is ſcarce poſſible to make a " fine Garden in a bad Soil." And, " In ſhort a Gar- " den *neceſſarily requires* the Sun," moſt wonderful Wiſ- dom! " A good Soil," I deny it; " the Care of the " Gardener, and Water."—But that the Reader may not go without his Inſtructions concerning a Garden, and its Situation, I will inſert them here *verbatim*; which if he can make Senſe of, the ROYAL SOCIETY will be infinite- ly obliged to him, for clearing up the Ignorance of one of their worthy Members. Under the Word *Garden* are theſe Inſtructions;

" 1. If the Situation be on a Plain or Flat, it has " ſeveral Advantages; Floods and Rains make no " Spoil: The Air is even more pure than on the Side " of an Hill: There is a continued Proſpect of Cham- " pains interſected by Rivers, Ponds, and Brooks, fine " Meadows, and Hills covered with Buildings and " Woods." I can name twenty Plains, and as many Flats, that have no ſuch Proſpect.

" 2. The level Surface is leſs tireſome to walk on; " but the greateſt Diſadvantage of flat Gardens is the " Want of an extenſive Proſpect which riſing Grounds " afford." Here he contradicts the firſt Paragraph, wherein he magnifies the Proſpect of a Plain or Flat, contrary to common Senſe!

3. Again, " Gardens on a perfect Level are the " *beſt*, as well for the Conveniency of walking as that " their

contrary out of his abundant Stock of Ignorance.

H 4 Apricots,

" their long Allies and Glades have no Riſings nor " Fallings;" moſt exquiſite Knowledge, the Man has found out that there are no Riſings nor Fallings in a Level! I ſuppoſe he learnt this of Dr DESAGULIERS.

4. Again, " A Situation on a riſing Ground is moſt " eſteemed, and indeed if it be not too ſteep *has the* " *moſt Advantages*, if the Slope be eaſy and imperceptible, and a good deal of Level may be had." Here he contradicts the three foregoing Paragraphs, particularly the laſt, that ſays, " *Gardens on a perfect Level are* " *the beſt.*"

5. Again, " Situations in mountainous Places or in " the Bottoms of Vallies ſhould not be choſen, but thoſe " which are on the Side of an Hill are the more happy," here he contradicts the firſt and third Paragraphs again.

6. Again, " Gardens on a gentle Aſcent are not " quite ſo agreeable and convenient, although the Shelving be ſo little as not to be perceived, for it fatigues " and tires a Perſon to walk either up Hill or down Hill." I fancy he had this Piece of Knowledge from DOCTOR RICHARD ROCK. " Without finding ſcarcely a reſting " Place." I never heard of any Law to forbid twenty reſting Places. Here he contradicts the fourth Paragraph which ſays that " Gardens on a riſing Ground have the " moſt Advantages." Don't this Jargon convince every Man of the Neceſſity of having all Books examined by proper Judges, to hinder People from being impoſed on by every Blockhead that has the Aſſurance to publiſh

two

What Aſpects are proper for the different Sorts of Peaches, Apricots, Nectarins, Plumbs, Grapes, Pears, Morella Cherries, *Dutch*-Currants.

Apricots, early Peaches, and late Winter Pears, ſhould have an Eaſt or Weſt Wall; common Sorts of Peaches and Nectarins, a South-Eaſt or South-Weſt Wall; Vines, and late Peaches, and Nectarins, ſuch as the *Katherine*-Peach, and the green and marbled Nectarins, ſhould have a South Wall, and if it incline two or three Points to the Eaſt it will be the better, that Aſpect being found by Experience beſt in our Climate for all ſuch late Fruits, by having the Advantage of the Morning Sun; North-North-Eaſt and North-Weſt Walls may be uſed for planting Plumbs, Pears, and Morella Cherries, or white *Dutch* Currants,

Plumbs, Pears, Morella Cherries, *Dutch* Currants, fit for Eſpaliers.

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two large folio Volumes, by ſtealing a little from one, and filching a little from another, without the leaſt Judgment to put them together? But to give the Devil his due, he has given the trueſt Character of his Lucubrations that ever Man did, in three Words, which ſerve as a Motto to ſome Coat of Arms next the Title-Page, viz. "*Nullius in verba.*" So that it ſeems he is the *Sancho* of this Age, ("*Y aſſi en mi la gana de hab-lar, ſiempro es primiero movimiento, y no puedo dexar de dezir, por una vez ſi quiera, lo qui me viene a la lengua,*") by writing as the other ſpoke.

rants, which may likewiſe be planted for Dwarfs or Eſpaliers.

Method of planting Fruit Trees, in wet, ſtiff, clayey Lands.

In the planting of theſe different Sorts of Trees, either againſt Walls, or for Dwarfs or Eſpaliers, Care ſhould be taken not to bury the Roots above ſix Inches deep, under the Surface of the Border, or other Ground where they are planted, and to ſpread the Roots horizontally, laying two Tiles, or two or three Bricks cloſe under them ſo ſpread to prevent their running with Tap-Roots into the Clay, which would make them much leſs fruitful.

Pear-trees to be planted different from the reſt of the Fruit-trees.

But this Practice of laying Tiles or Bricks under the Roots need not be uſed with Pear-trees, becauſe they naturally incline to run right down with Tap-roots, and are not injured or rendered leſs fruitful by running down into the Clay.

What Stocks are beſt for budding Peaches and Nectarines on, deſigned for a wet, ſtiff Soil.

Peaches and Nectarin-trees planted on this ſort of Land ſhould be inoculated or budded on Plumb-ſtocks, but for dry Soils,

Soils they are beſt budded on wild Peach or Almond Stocks.

How to manage the tender Sorts of Nectarins and Peaches.

Such Sorts as are tender and very ſubject to blight, whatever Soil they are to be planted on, ſhould be inoculated on a Peach that has been before inoculated on Plumb, Peach, or Almond Stocks; according to the Soil they are to be planted on.

The Stones of the broad leaved Sorts beſt for Stocks to inoculate Peaches and Nectarins on, and not on Suckers as the common Practice is.

Theſe Sorts of Trees (on whatever Soil planted) ſhould be inoculated on Stocks raiſed from the Stones of broad leaved Sorts, and not on Stocks raiſed from Off-ſets on Suckers according to the common Practice of Nurſerymen. Experience has fully proved that Trees ſo inoculated will decay and die in twenty Years or leſs according to the Soil they grow in; whereas thoſe inoculated on Stocks raiſed from the Stone in the ſame Ground endure twice that time and are much leſs ſubject to Blights.

In

In the ſame manner Apricock-trees ſhould be raiſed by inoculating them on Plumb Stocks raiſed from the Stone; but the beſt Improvement is by inoculating them on an early *Newington* Peach, that has been before before inoculated on a Plumb-Stock, which makes the Fruit much larger and finer than otherwiſe it would be. I do not know but any Peach may do as well as the early *Newington*, but I mention this as an Experiment I have made on ſeveral Trees, and the Fruit for ten Years has proved much larger and finer than the Tree from whence the Bud was taken, which ſtood near them, and in the ſame Soil; with this Difference likewiſe, that the Fruit did not part from the Stone, although the Fruit from whence the Bud was taken did.

Plumb Stocks raiſed from the Stone beſt for Apricocks.

Pear Trees for Walls, Dwarfs, or Eſpaliers, in this or any other Sort of Land that has a loamy or moiſt Bottom, ſhould be grafted or inoculated on Quince-Stocks raiſed from the Kernel, by which means they will make ſtronger and more laſting

Quince Stocks raiſed from the Kernel beſt for Pear-Trees.

laſting Trees, and leſs liable to ſpawn out or run to Suckers than thoſe grafted or inoculated on Stocks raiſed from Off-ſets or Suckers; and as the Trees raiſed in this Manner will be ſtronger and more vigorous, the Fruit will no doubt be larger and finer.

The beſt Method to improve Pears by grafting.

The beſt Way of meliorating and improving any ſort of Pear is to graft or inoculate it on a Tree that has been before grafted on a Quince-Stock, by which means (as in the Inſtance before of the Apricock) the Fruit will grow much larger and finer, as I have likewiſe proved by ſeveral Years Experience; beſides this Practice has another very great Advantage, that the Trees after double grafting are remarkably more fruitful.

Apples much improved by double grafting.

This Experiment has been made with equal Succeſs on Apple Trees; the double grafting of which has much improved the Largeneſs and Fairneſs of the Fruit, without any Alteration in the Quality

Quality of it, though grafted on Trees of different Kinds; for the Nature of the Fruit is not at all altered by the Nature of the Stock on which it is grafted, contrary to the Opinion of our ingenious Writers.

Double grafting does not alter the Quality of the the Fruit.

There are many Experiments to confirm this, but I ſhall only produce one that has been obſerved in *Kent*, *viz.* That their Pippins which were formerly grafted on a ſweet Apple, called a Founding, are as ſharp in the Taſte and have all the other Qualities as the ſame Fruit grafted (as it has been of late Years) on wild Crab Stocks.

Example to prove the above Hypotheſis.

This valuable Fruit, the *Kentiſh* Pippin, is almoſt loſt amongſt us, occaſioned by the Decay of old Orchards and the Nurſerymen not knowing properly how to raiſe them, having neglected propagating this Sort of Fruit on Account of their cankering and dying ſoon after grafting.

Ignorance of the Nurſerymen, the Occaſion of the Loſs of the *Kentiſh* Pippin.

To

Method how to raiſe the *Kentiſh* Pippin in the ſame Perfection it was formerly.

To remedy this Inconvenience, and raiſe this Fruit in the ſame Perfection it was formerly, the wild or Crab Stock ſhould be firſt grafted near the Ground with the ſweet Apple called the Founding, (or perhaps any other ſweet Apple may do) and when the Shoot from this Graft is grown big enough, it ſhould be grafted with the *Kentiſh* Pippin about ſix Foot high.

The above Method confirmed by Demonſtration to be the ſame as our Forefathers uſed.

By this Method the Fruit may be raiſed with Succeſs, it appearing to be the ſame by which many, if not all, the old Pippin Orchards in *Kent* were formerly raiſed; for I have obſerved in ſeveral of thoſe old Orchards, that many of the Pippin-Trees have thrown out Shoots about five Foot high, near the Place they had been grafted at, and thoſe Shoots (not being cut off in the pruning the Orchard) have grown large enough to bear Fruit which has been conſtantly obſerved to be the Sort of ſweet Apple called in *Kent* the Founding; from whence

whence it is plain, that Pippins were formerly raiſed by firſt grafting the wild Stock with the Founding, and then grafting the Pippin on the Founding.

This Method of twice grafting or inoculating for the Raiſing of *Kentiſh* Pippins, and Improvement of the ſeveral Fruits before mentioned, I doubt not may be applied to the Improvement of other Fruits, as the Peach, Nectarin and Plumb, *&c.* as I have experienced in the Medlar, which, grafted on a Pear that was before grafted on a Quince-Stock, did produce very fine Fruit.

The Method of twice grafting good for other Fruits beſides the *Kentiſh* Pippin.

Whether this Kind of Improvement may be carried further by more than twice grafting or inoculating, I know not, but ſhould think it well worth the Trial of the Curious.

Query, whether further Improvements may not be made in the ſame Way?

This Practice of raiſing from the Kernel inſtead of the Sucker, and of twice grafting or inoculating, I fear is too ſlow a Pro-

The Uſefulneſs of raiſing Stocks from the Kernel, and twice

grafting, not eaſily to be followed by our Nurſerymen.

a Proceeding for Nurſerymen to follow; but if they would keep ſome Trees raiſed by theſe Methods of the Kinds before experienced, and would likewiſe twice inoculate all Peaches and Nectarins (or at leaſt all the tender Kinds) no Perſon the leaſt curious or conſiderate but would give a Price extraordinary for Trees ſo raiſed.

Good Grapes may be produced even one hundred Miles North of *London*.

But to return to my Subject of wet and ſtiff Soils. I expect it will be objected that I have improperly propoſed the planting Vines on ſuch kind of Land; but if the Method I have before directed be followed, the right Kinds of Vines planted, and proper Care taken in the pruning and managing, I doubt not but good Grapes may be produced, even if it were in a Situation above one hundred Miles North of *London*.

The Walls proper for the different Sorts of Grapes.

The Wall I have propoſed for that Purpoſe, is a South Wall; if it inclines a little to the Eaſt it will do beſt for the lateſt

lateſt ripe Grapes, if to the Weſt for the earlieſt ripe.

The Sorts I ſhould recommend for ſuch a Soil are ſuch as in common Gardens are uſually ripe by, or before, the middle of *September*; ſuch as the white and black ſweet Waters, the Cluſter, the *Dutch* and Royal Muſcadines, and the blue *Frontiniack*, but none later ripe than this laſt Sort ſhould be planted in ſuch a Soil.

The proper Sorts of Grapes for ſtiff clayey Lands.

The Method of pruning and ordering Vines, Apricocks, Peaches, Nectarins, Plumbs, and Pears is done ſo exact and with ſo much Judgment by the Rev. Mr *Lawrence* in his Treatiſe of Gardening, that it would be great Imprudence in me to pretend to give Directions about that Subject.

The Rev. Mr *Lawrence* the beſt Writer amongſt the Moderns on Gardening.

Altho' theſe Sorts of Soil do not produce Fruit quite ſo early as higher and warmer Soils, yet in ſome Sorts of Fruits they have the Advantage; particularly Apples

Clayey Soils produce ſome Sorts of Fruits in greater Perfection than better Soils.

Fruits that grow on clayey Grounds keep longer than thoſe that grow on warmer Bottoms.

and Pears. Apples from ſuch kind of Land will keep ſound and good much longer in the Fruit-Loft than from other Soils; and the fine melting Winter-Pears from Dwarfs, ſuch as the *St Germains*, Creſan, *&c.* that from other Soils decay the latter End of *October* and Beginning of *November*, will from theſe Kinds of Land keep good in *December* and *January*.

Directions for laying out a a Kitchen-Garden on ſtiff clayey Grounds.

As to Kitchen Gardens on theſe Sorts of Soil, the Mould ſhould be raiſed (if occaſion) to be eighteen Inches, at leaſt, above the Clay, and at about every twelve or fourteen Foot Diſtance ſmall Ditches or Trenches ſhould be dug one Foot wide, and one Spit deep in the Clay to carry off the Water; which by a croſs Trench ſhould be carry'd off the moſt convenient Way into the adjoining Ground, or into ſome Pond or Canal, as before directed; and by obſerving this Method, ſuch kind of Ground may be made to anſwer very well all the Purpoſes of a Kitchen Garden.

But

But as a Kitchen Garden requires a ſtronger Sort of Manure than open Fields, the beſt for this Purpoſe will be Stable or Yard Dung, Sea-Coal Aſhes, and the Mould of rotten Turf, which ſhould be got by digging Turfs about ſix Inches deep in ſome waſte Ground or old Paſture on a light Soil, laying it in a Mixen, and turning it every three or four Months, till rotten and fit for Uſe.

The beſt Manures for a Kitchen Garden.

CHAP. XIII.

Obſervations on Hills.

Veritatis luce menti hominis nihil dulcius.
CICER.

Ignorance in the Meaſuring of Hills, very detrimental to Gentlemen and Farmers.

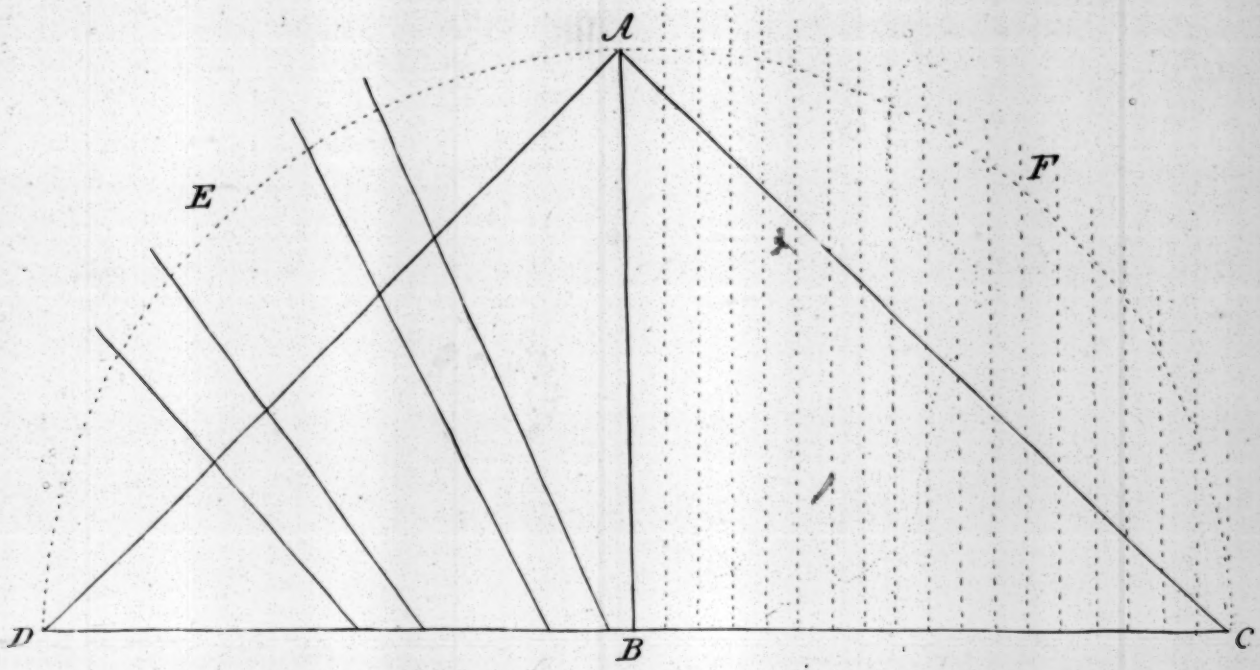
THERE is a certain Proportion in the Value of hilly Grounds and flat Grounds, which few are aware of, that much concerns the Buyer and Farmer to know, becauſe their Ignorance in this muſt be very detrimental to both.

Hills, whatever their ſuperficial meaſure be, can produce no more Corn or Plants than their Baſe can grow.

All Hills can produce no more Corn, Graſs, Trees, or Vegetables of any ſort than their Baſe will produce.— For inſtance, if a Hill contains three times as many Acres of Land in ſuperficial Meaſure, as the Ground it ſtands on (or its Baſe) would meaſure, yet that triple Quantity of Land contained on the Hill will produce no more Corn, Graſs, Trees,

or

Plate VII. facing Chap. XIII. p 116.



or Vegetables of any ſort, than what would grow on the plain Ground (or Baſe) where the Hill ſtands that meaſures but one third of the Acres contained on the Hill.

Reaſon why Hills cannot produce more Corn, &c. than their Baſes.

The Reaſon of which is this—— All Vegetables grow upright, ſo that they abſolutely require a ſolid Baſe or Foundation to ſupport their Erection; which cannot be found on a Hill, any farther than the plain Ground, or Baſe the Hill ſtands on, which is the only Support or Foundation that the Hill has.

A Demonſtration that Hills cannot produce any more Corn, &c. than their Baſes will grow.

It is evident by Figure 1. Plate VII. that no more Perpendiculars can be raiſed, and conſequently no more Trees, Plants, or Corn can grow on the pricked Line D. E. A. F. C. than on the Baſe D. B. C. —— Therefore ſuch kind of Hills muſt be computed by meaſuring D. B. C. the Baſe for the Breadth and not the pricked Line D. E. A. F. C. which would make it above one Third more than the true Meaſure.

The Uſe that Noblemen and Gentlement may make of the above Problem.

This may be of great Service to Noblemen and Gentlemen when they purchaſe Eſtates, or Farmers when they take Farms that contain hilly Grounds. ——In this Caſe the Baſe or Plain on which the Hill ſtands ſhould be meaſured, and then purchaſe or hire the whole Hill according to the Number of Acres contained in the Baſe and no more; —— unleſs there be an Allowance made in the Price, according to the Proportion that the Ground bears at the Bottom of the Hill.

The Application of the above Problem in buying and hiring of Land.

Thus if the Meadow-Ground at the Bottom of the Hill lets for ten Shillings an Acre, and the Hill meaſures thirty Acres, and its Baſe, or the Ground on which it ſtands only twenty Acres—The whole thirty Acres that the Hill meaſures are really worth no more than ten Pound *per Annum*, becauſe there can grow no more Corn, Graſs, Trees, or Vegetables than twenty Acres of the Meadow-Land at the Bottom would produce; which

are

are ſuppoſed equal to the Number of Acres contained in the Baſe or plain Ground, on which the Hill ſtands.

Theſe Obſervations may be uſefully applied to Wood-Land that pays Tythe by the Acre, in which Gentlemen will ſave at leaſt a Third by following the above Rules, and do juſtice between Man and Man.

The Uſe of the above Problem to Wood-Lands that lie on Hills, when they pay Tythe by the Acre.

The Knowledge of theſe Rules may likewiſe convince Gentlemen and Farmers of the Neceſſity of ploughing or digging up their Mole-Hills, which always diminiſh the Crop.

The Mole * generally throws up the worſt of the Mould to the Top, as may

Reaſon why Mole-Hills do not produce ſo good Crops of Graſs, as thoſe Lands do on which they lie.

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* *Tum variæ illudunt peſtes. Sæpe exiguus mus*
Sub terris poſuitque domos atque horrea fecit:
Aut oculis captis fodere cubilia talpæ.
VIRG. Geor. Lib. 1.

The Poiſon preſcribed for the *Baltick* Rats in Chap. IX. will alſo deſtroy them if made up into Pills and and laid in their Ruts under Ground.

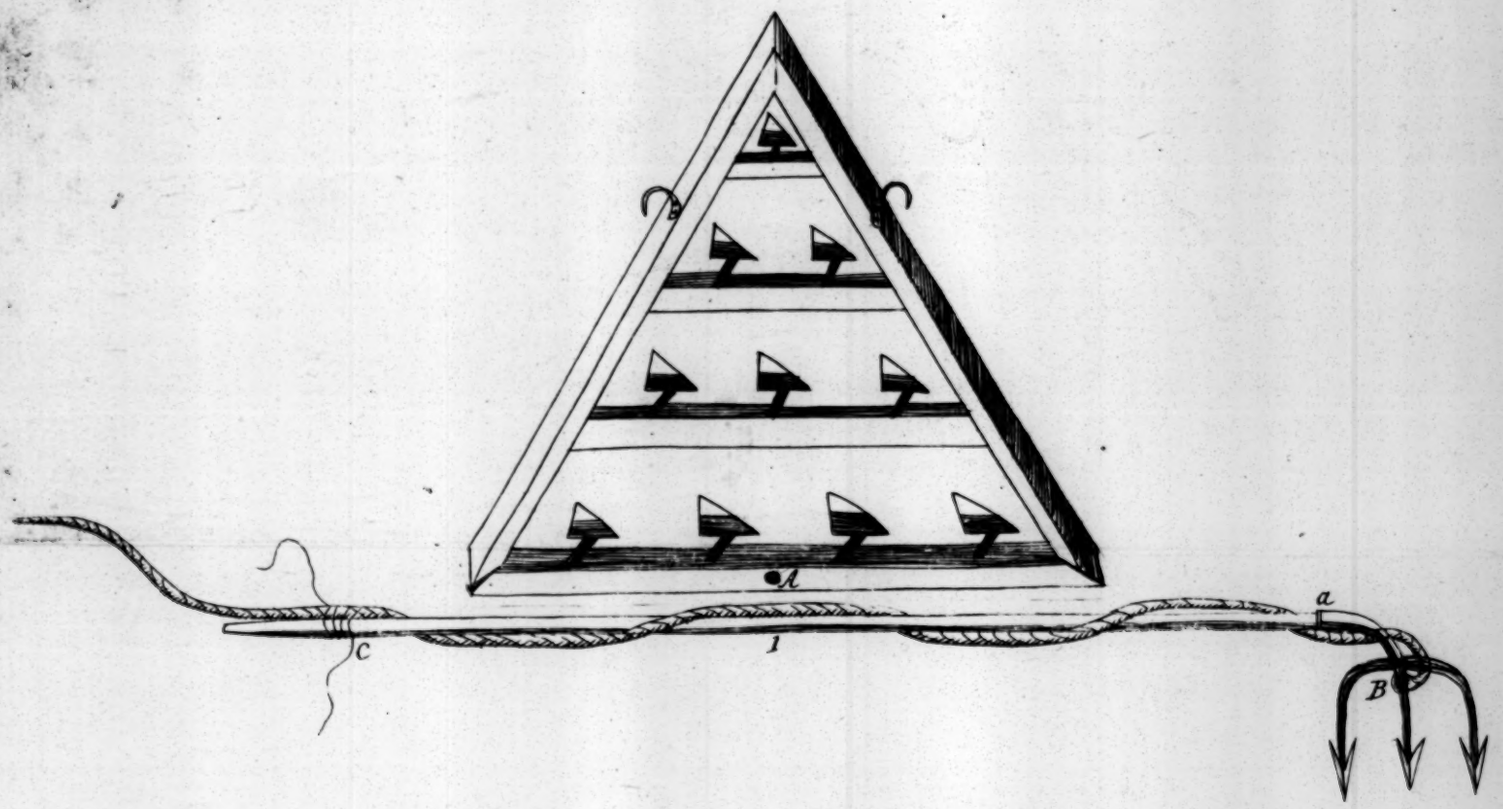
be ſeen in all Grounds that have loamy Bottoms; beſides the Hills being ſo ſmall and round are much more expoſed to the Sun and Droughts than the other Grounds, and the Rain running ſo ſoon off the Hills, they are deprived of that Nouriſhment which is requiſite to the Vegetation of Plants; which occaſions the Shortneſs and Thinneſs of the Graſs that grows on them.—But though Mole-Hills by this Expoſure to the Sun and Winds, are not fruitful in producing Graſs ſo good as the Ground where they ſtand, yet by the Heat of the Sun, and not ſpending their Strength in Vegetation, the Earth of which they are compoſed is meliorated, and when ſpread on the Land will mend the Paſture † or they will make a good Mixin and Manure, when burnt as above directed.

I think I have now ſaid as much as my Subject requires, and I hope no

† See the Method of ſpreading the Mole-Hills, and making them into a Mixin, or burning them, in Chap. X.

more

Plate VIII. The Figure of a Hough Harrow and Creeper. at the end of the Book.



more than will be found uſeful and plain; becauſe it is founded (as I promiſed in the Introduction) on Facts and Experiments that really ſucceeded; and I deſire Gentlemen and Farmers will ſo far believe me as to make trial of it; without which their Faith will be vain and uſeleſs, as all others are without Works, notwithſtanding what the *Don* * *Quixotes* of all Ages have ſaid to the contrary; and that every Gentleman and Farmer may find real Advantage by this Treatiſe is the ſincere Deſire of the Author.

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* Si os la monſtrara, replicò Don Quixote, que hizierades voſotros en confeſſar una verdad tan notoria? La importantia eſta en que ſin verla lo aveys de creer confeſſar, afirmar, jurar, y defender! Cervantes Saavedra. Capitulo IV.

F I N I S.

E R R A T U M.

Page 89. Line 4 dele IV.

INDEX.

A.

B.

Boggs,

INDEX.

Expences

INDEX.

E.

F.

G.

H.

Hills,

INDEX.

Mole-hills

INDEX.

Rain,

INDEX.

R.

S.

T.

V.

Walls,

INDEX.

W.

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